



Ralph De Palma receiving the flag at the finish of the Elgin National Trophy Race. Right—E. C. Patterson, of Chicago, entrant of De Palma, congratulating him on his victory

De Palma in Mercedes Wins Both Races At Elgin—Records Broken

Elgin National Trophy

Car	Driver	Time	M.P.H.
Mercedes	De Palma	4:06:18	73.53
Mercer	Pullen	4:07:28	73.17
Stutz	Oldfield	4:24:02	68.59
Sunbeam	Maurice	4:31:09	66.78
Burman Sp.	Hearne	4:35:47	65.79

Chicago Automobile Club Cup

Mercedes	De Palma	4:05:01	73.91
Stutz	Anderson	4:05:45	73.69
Peugeot	Mulford	4:08:16	72.94
Stutz	Oldfield	4:15:23	70.91
Braender B'dg.	Chandler	4:22:58	69.88
Marmon	Heineman	4:33:18	66.26
Stutz	Dearborn	4:37:29	65.23
Gray Fox	Wilcox	4:37:43	65.18

Stutz Second on Friday, Mercer on Saturday — Wishart Killed on Saturday — Tires Make Wonderful Showing

CHICAGO, ILL., Aug. 24—Snatched from the jaws of war, the German Mercedes which Louis Wagner drove to second place in the French Grand Prix of 1914 was piloted to victory by Ralph De Palma, entered by E. C. Patterson of the Chicago Automobile Club, in the fifth annual road races at Elgin, Friday and Saturday of last week, winning the Chicago Automobile Club Cup and the Elgin National Trophy. The races were conducted by the Chicago Automobile Club and the Elgin Automobile Road Race Assn.

Records for the Course Broken

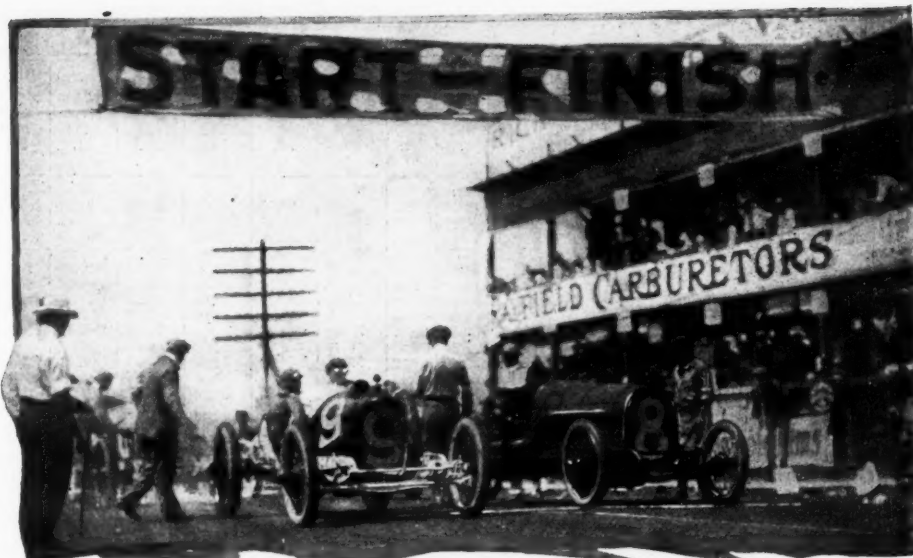
Previous records for the course were broken in both events, and on Friday it looked for a time as if a new world's record would be made, for Spencer Wishart was sending his Mercer around the course at 80 miles an hour with only eleven laps to go when a leaky gasoline tank brought him to a stop. De Palma's average for the Chicago Automobile Club Cup Race on Friday was 73.91 miles per hour for the 301.84 miles,

five of them. But the racing men were the greatest sufferers. His chest crushed, a leg broken, and injured internally, Wishart and his mechanic were rushed to the St. Joseph's hospital in Elgin but Wishart lived only long enough for Mrs. Wishart to reach his bedside. Jack Genter, the mechanic, was badly injured. He died on Wednesday morning, after having been despaired of by the physicians in charge.

Two-Car Start Works Well

From a racing viewpoint, though, the meet was a great success. On both days the attendance was a record breaker; the largest field of entries ever secured for an American road race started; the weather was of the best and the promoters will be able to show a fair profit.

The meet was remarkable for the introduction of the two-car start as used in the French Grand Prix and the Pendleton scoreboard made its eastern début. Both worked to perfection. Because of having twenty-eight starters the second day and twenty on the first day, the two-car start was a necessity. Starter Wagner sent the contestants away in pairs without a hitch, a broad white line from the tape to Hornbeek's turn making two lanes. Each car had to stay in its own lane for the first lap until the turn was reached, after which it was free to choose its way dur-



Start of Saturday's race, showing how cars were started in pairs

ing the rest of the race, the idea being to insure a safe and orderly start.

The Pendleton scoreboard, designed by E. H. Pendleton of Los Angeles, Cal., recorded the exact position of each car at each mile of the course and as soon as a car finished a lap, the lap number also was posted. This information was secured by means of a telephone system around the course, one at each mile. Girl operators were used, each telephoning when a car passed her station. There was no hitch on either day.

GLAD FOR THE ELGIN NATIONAL TROPHY—FREE FOR ALL

18 150 Miles 4860 Ft.	19 159 Miles 1610 Ft.	20 167 Miles 3640 Ft.	21 176 Miles 390 Ft.	22 184 Miles 2420 Ft.	23 192 Miles 4450 Ft.	24 201 Miles 1200 Ft.	25 209 Miles 3230 Ft.	26 217 Miles 5260 Ft.	27 226 Miles 2010 Ft.	28 234 Miles 4040 Ft.	29 243 Miles 790 Ft.	30 251 Miles 2820 Ft.	31 259 Miles 4850 Ft.	32 268 Miles 1600 Ft.	33 276 Miles 3630 Ft.	34 285 Miles 350 Ft.	35 293 Miles 2410 Ft.	36 301 Miles 4440 Ft.	Position at Fin- ish	Miles per Hour
2:06:48 6:46	2:13:34 6:46	2:20:16 6:42	2:26:59 6:43	2:33:42 6:43	2:40:20 6:38	2:47:10 6:40	2:53:48 6:38	3:00:26 6:38	3:07:06 6:40	3:13:49 6:43	3:20:21 6:32	3:26:51 6:30	3:33:27 6:36	3:39:57 6:30	3:46:30 6:33	3:52:58 6:28	3:59:35 6:37	4:06:18 6:43	1	73.53
2:04:04 6:53	2:11:00 6:56	2:17:59 6:59	2:24:54 6:55	2:31:52 6:58	2:38:45 6:53	2:45:42 6:57	2:52:35 7:53	2:59:28 6:53	2:06:19 6:51	3:13:05 6:46	3:19:50 6:45	3:26:36 6:46	3:33:22 6:46	3:40:10 6:48	3:46:55 6:45	3:53:45 6:50	4:00:31 6:46	4:07:28 6:57	2	73.17
2:09:12 7:41	2:18:07 8:55	2:25:11 7:04	2:32:16 7:05	2:39:16 7:00	2:46:25 7:09	2:53:58 7:33	3:02:36 8:38	3:09:47 7:11	2:17:56 7:07	3:24:05 7:09	3:31:44 7:39	3:40:03 8:19	3:47:14 7:11	3:54:26 7:12	4:01:42 7:16	4:09:46 8:04	4:16:59 7:13	4:24:02 7:03	3	68.59
2:20:05 7:32	2:27:29 7:24	2:34:46 7:17	2:42:03 7:17	2:49:27 7:24	2:56:39 7:12	3:03:56 7:17	3:11:08 7:12	3:18:23 7:15	3:25:46 7:23	3:32:52 7:06	3:39:56 7:04	3:47:10 7:14	3:54:31 7:21	4:01:58 7:27	4:09:15 7:17	4:16:36 7:21	4:23:58 7:22	4:31:09 7:11	4	66.78
2:16:11 7:53	2:23:52 7:41	2:31:30 7:38	2:41:28 9:58	2:49:03 7:35	2:56:40 7:37	3:04:14 7:34	3:11:49 7:35	3:19:27 7:38	3:26:50 7:32	3:34:28 7:29	3:42:52 8:24	3:51:18 8:26	3:58:44 7:26	4:06:17 7:33	4:13:43 7:26	4:21:03 7:25	4:28:31 7:23	4:35:47 7:16	5	65.79
2:01:34 6:52	2:08:27 6:53	2:15:22 6:55	2:22:31 7:09	2:29:31 7:00	2:36:32 7:01	2:43:54 7:02	2:50:32 6:58	2:57:24 6:52	3:04:29 7:05	3:11:25 6:56	3:18:25 7:00	3:25:17 6:52	3:32:23 7:06	3:41:48 9:25	3:49:32 7:44	3:57:07 7:35	Out—engine trouble			
2:37:20 7:31	2:44:42 7:22	2:52:05 7:23	2:59:42 7:37	3:08:59 9:17	3:18:02 9:03	3:25:22 7:20	3:33:14 7:52	3:41:34 11:20	3:51:01 6:27	3:58:34 7:33	4:06:06 7:32	4:13:36 7:30	4:21:03 7:27	4:28:35 7:32	4:36:23 7:48	Running	when flagged			
2:02:39 6:41	2:09:20 6:41	2:15:56 6:38	2:23:34 7:36	2:30:30 6:56	2:37:18 6:48	2:44:00 6:42	2:50:38 6:38	2:57:16 6:35	3:03:51 6:49	3:10:40 6:49	3:17:24 6:44	3:24:04 6:40	3:30:44 6:47	3:37:31 6:47	Out—broken driveshaft					
2:37:05 7:29	2:44:53 7:48	2:52:17 7:24	2:59:55 7:38	3:07:32 7:37	3:15:12 7:40	3:22:47 7:35	3:30:20 7:35	3:37:51 7:31	3:45:31 7:40	3:53:08 7:37	4:00:45 7:37	4:08:21 7:36	4:15:59 7:38	4:25:27 9:28	Running	when flagged				
2:07:30 7:09	2:14:47 7:17	2:21:56 7:09	2:39:40 7:44	2:46:57 7:17	Out—engine trouble															
2:17:13 7:37	2:25:57 8:34	2:33:34 7:37	2:41:14 8:40	2:49:54 8:14	Out—engine trouble															
2:12:57 7:30	2:20:03 7:06	2:27:19 7:16	2:39:40 12:21	Out—brakes																
2:25:30 7:02	2:32:39 7:09	2:45:37 12:58	Out—disabled																	
2:08:58 6:42	2:15:42 6:44	Out—radiator	trouble																	

RECORD BY LAPS OF THE CARS THAT COMPETED FOR THE CHI

No.	Car	Driver	Lap Time	1 8 Miles 2030 Ft.	2 16 Miles 4060 Ft.	3 25 Miles 6150 Ft.	4 33 Miles 8240 Ft.	5 41 Miles 10330 Ft.	6 50 Miles 12420 Ft.	7 58 Miles 14510 Ft.	8 67 Miles 16600 Ft.	9 75 Miles 18690 Ft.	10 83 Miles 20780 Ft.	11 92 Miles 22870 Ft.	12 100 Miles 24960 Ft.	13 108 Miles 27050 Ft.	14 117 Miles 29140 Ft.	15 125 Miles 31230 Ft.	16 134 Miles 33320 Ft.	17 142 Miles 35410 Ft.
10	Mercedes.....	R. DePalma.....	Elaps.	6:42	13:15	19:44	26:18	33:02	39:40	46:13	52:51	59:33	1:06:12	1:12:53	1:19:36	1:26:14	1:32:59	1:39:37	1:46:19	1:54:10
22	Stuts.....	G. Anderson.....	Lap...	6:42	6:53	6:29	6:34	6:44	6:38	6:33	6:38	6:42	6:39	6:41	6:43	6:38	6:45	6:38	6:42	7:51
6	Peugeot.....	R. Mulford.....	Elaps.	6:52	13:31	20:14	26:55	33:38	40:19	47:02	53:45	1:00:28	1:07:11	1:13:54	1:20:37	1:27:20	1:34:03	1:40:46	1:47:29	1:54:12
11	Stuts.....	B. Oldfield.....	Lap...	6:27	13:11	20:04	26:57	33:50	40:43	47:36	54:29	1:01:22	1:08:15	1:15:08	1:22:01	1:28:54	1:35:47	1:42:40	1:49:33	1:56:26
31	Braender-Bulldog.....	W. Chandler.....	Elaps.	7:12	14:12	21:12	28:12	35:12	42:12	49:12	56:12	1:03:12	1:10:12	1:17:12	1:24:12	1:31:12	1:38:12	1:45:12	1:52:12	2:00:12
30	Marmon.....	L. Heinemann.....	Lap...	7:00	14:00	21:00	28:00	35:00	42:00	49:00	56:00	1:03:00	1:10:00	1:17:00	1:24:00	1:31:00	1:38:00	1:45:00	1:52:00	2:00:00
1	Stuts.....	F. H. Dearborn.....	Elaps.	7:15	14:10	22:16	27:02	35:47	42:30	49:13	55:56	1:02:39	1:09:22	1:16:05	1:22:48	1:29:31	1:36:14	1:42:57	1:49:40	1:56:23
27	Gray Fox.....	H. Wilcox.....	Lap...	8:10	15:12	22:40	30:07	37:30	44:50	52:25	59:47	1:07:11	1:14:45	1:22:08	1:29:38	1:37:05	1:44:26	1:51:45	1:59:02	2:06:21
17	White.....	W. J. Schunk.....	Elaps.	7:06	13:51	20:37	27:25	34:16	41:02	47:51	54:47	1:01:40	1:08:29	1:15:18	1:22:07	1:28:56	1:35:45	1:42:34	1:49:23	1:56:12
19	Mercer.....	S. Wishart.....	Lap...	19:04	28:12	43:34	52:45	1:01:27	1:10:04	1:19:15	1:27:42	1:36:29	1:45:16	1:54:03	2:02:50	2:11:37	2:20:24	2:29:11	2:37:58	2:46:45
21	Pahys.....	M. Roberts.....	Elaps.	6:31	12:42	18:55	25:08	31:23	37:40	43:55	50:14	56:29	1:02:49	1:09:07	1:15:23	1:21:40	1:27:56	1:34:11	1:40:29	1:46:49
26	Mercer.....	Henning.....	Lap...	7:37	14:44	21:59	29:32	37:00	44:35	52:10	59:45	1:07:20	1:14:55	1:22:30	1:30:05	1:37:40	1:45:15	1:52:50	2:00:25	2:08:00
12	Duesenberg.....	Tom Alley.....	Elaps.	7:39	15:08	22:45	30:22	37:51	45:18	52:47	1:00:16	1:07:45	1:15:14	1:22:43	1:30:12	1:37:41	1:45:10	1:52:39	2:00:08	2:07:37
24	Maxwell.....	W. Carlson.....	Lap...	8:43	15:36	22:19	29:03	35:57	42:38	49:20	56:03	1:02:45	1:09:28	1:16:11	1:22:54	1:29:37	1:36:20	1:43:03	1:49:46	1:56:29
28	Sunbeam.....	G. Maurice.....	Elaps.	7:43	15:12	22:44	30:11	37:26	44:25	51:24	58:23	1:05:22	1:12:21	1:19:20	1:26:19	1:33:18	1:40:17	1:47:16	1:54:15	2:01:14
9	Mercer.....	E. Pullen.....	Lap...	8:00	15:46	23:36	31:20	38:59	46:27	53:55	1:01:23	1:08:51	1:16:19	1:23:47	1:31:15	1:38:43	1:46:11	1:53:39	2:01:07	2:08:35
4	Maxwell.....	Tetslaff.....	Elaps.	7:10	14:01	20:48	27:35	34:23	41:05	47:54	54:39	1:01:28	1:08:22	1:15:16	1:22:10	1:29:04	1:35:58	1:42:52	1:49:46	1:56:40
9	Duesenberg.....	E. Rickenbacher.....	Lap...	7:37	15:07	22:26	29:33	36:44	43:52	51:02	58:18	1:05:49	1:13:00	1:20:11	1:27:22	1:34:33	1:41:44	1:48:55	1:56:06	2:03:17
14	Sunbeam.....	H. Grant.....	Elaps.	7:11	15:27	22:44	30:01	37:18	44:35	51:52	59:09	1:06:26	1:13:43	1:21:00	1:28:17	1:35:34	1:42:51	1:50:08	1:57:25	2:04:42

Wishart Takes the Lead

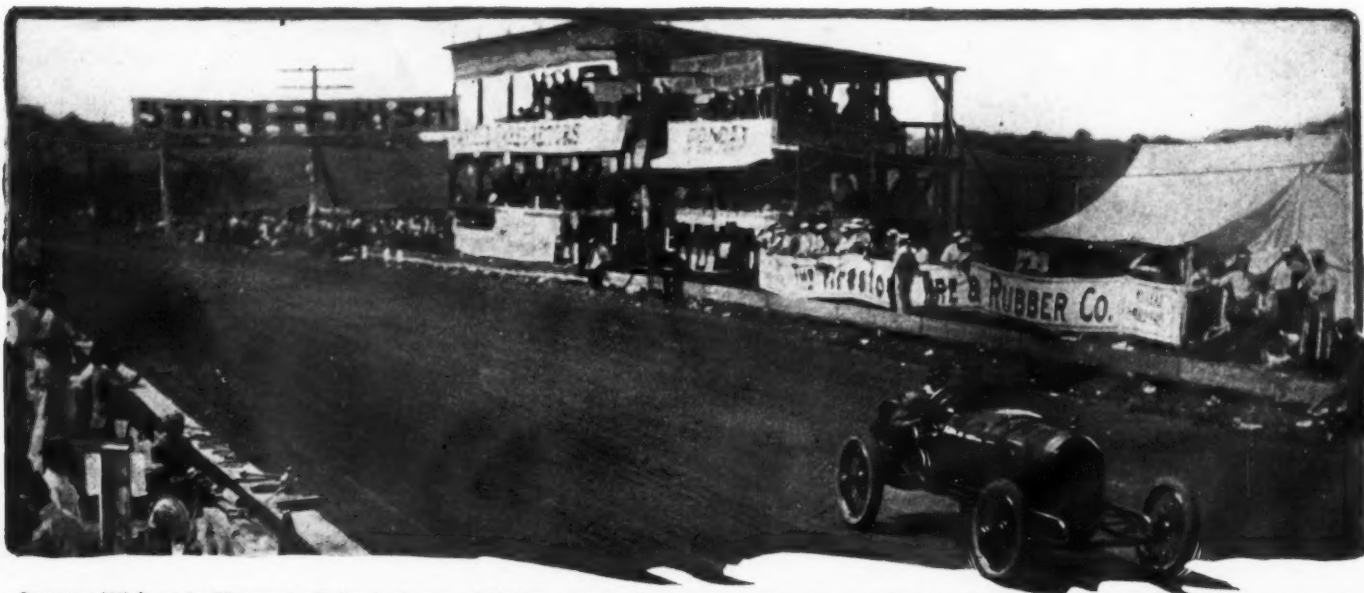
The first day's race for the Chicago Automobile Club trophy was for cars of 450 inches piston displacement and under. It brought to the tape twenty cars, Burman's Peugeot, Stringer's Marmon, D'Alene's Marmon, Callaghan's Keeton and No. 23 Maxwell being scratched. In this event Wishart was the dominating factor for twenty-five of the thirty-six laps. Gaining the front almost at the start, he had opened a gap of 9 minutes 40 seconds at the twenty-fifth lap when the vibration broke the support of the gasoline tank. His mechanic tried to hold the tank in place, but after a couple of laps Wishart gave up and retired.

This left it clear sailing for De Palma in the Mercedes and Anderson in the Stutz who settled down to a battle royal for the rest of the journey. It was a desperate fight, the

lead fluctuating often. At the end, though, De Palma had the edge by 44 seconds but the last lap saw interest keyed up to the last notch, De Palma gaining the laurel wreath. The victor made only three stops. One was for supplies, a second was to change a tire in the backstretch and the third was to take on a new tire at the pits.

Anderson's Spares Caused His Defeat

Anderson's defeat was largely caused by delay in the backstretch when he stopped several minutes to pick up his two spare tires which broke loose from their moorings. Anderson feared that he would be disqualified unless he carried the spares, whereas this is not in the rules. Had he left the tires by the roadside and picked up new ones at the pits it might have been a different story.



Spencer Wishart in Mercer in Saturday's race finishing the thirteenth lap, when he was leading in the race just before his fatal accident

CAGO AUTOMOBILE TROPHY—UNDER 450 INCHES DISPLACEMENT

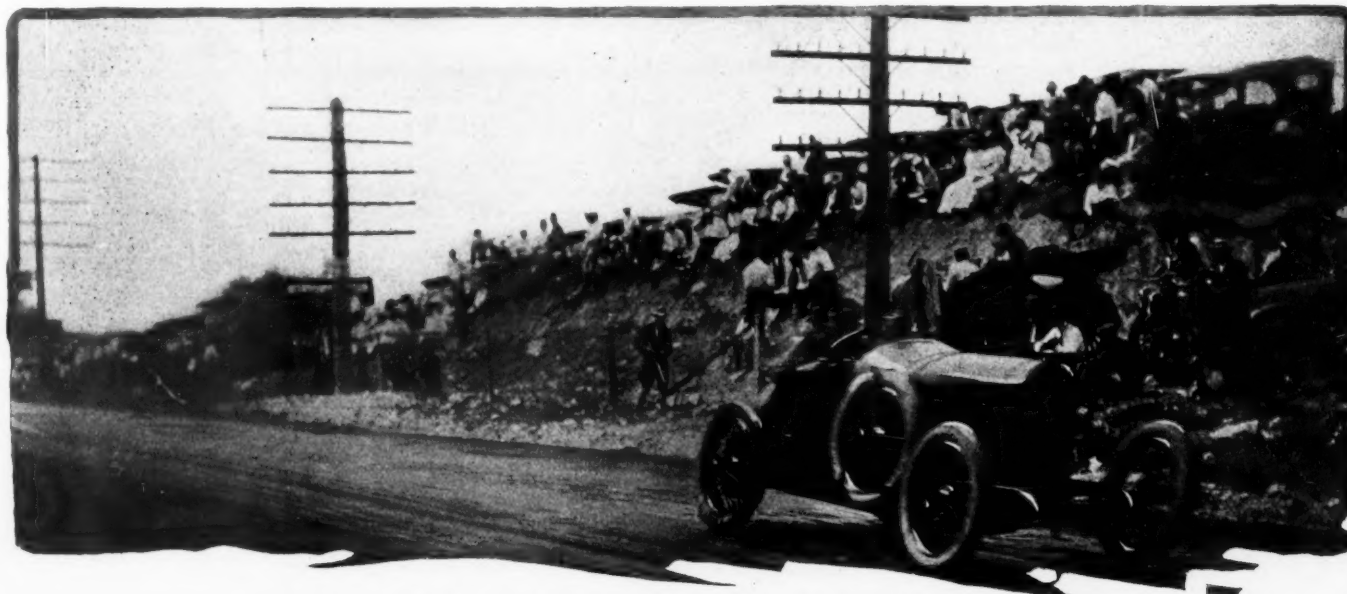
18 150 Miles 4860 Ft.	19 159 Miles 1610 Ft.	20 167 Miles 3640 Ft.	21 176 Miles 390 Ft.	22 184 Miles 2420 Ft.	23 192 Miles 4450 Ft.	24 201 Miles 1200 Ft.	25 209 Miles 3230 Ft.	26 217 Miles 5260 Ft.	27 226 Miles 2010 Ft.	28 234 Miles 4040 Ft.	29 243 Miles 790 Ft.	30 251 Miles 2820 Ft.	31 259 Miles 4850 Ft.	32 268 Miles 1600 Ft.	33 276 Miles 3630 Ft.	34 285 Miles 380 Ft.	35 293 Miles 2410 Ft.	36 301 Miles 4440 Ft.	Position at Fin- ish	Miles per Hour
2:00:44	2:07:22	2:13:56	2:20:37	2:27:23	2:34:14	2:40:56	2:50:57	2:57:50	3:04:35	3:11:10	3:18:20	3:24:51	3:31:37	3:38:16	3:44:55	3:51:32	3:58:16	4:05:01	1	73.91
6:34	6:38	6:34	6:41	6:46	6:51	6:42	10:01	6:53	6:45	6:35	7:10	6:31	6:46	6:39	6:39	6:37	6:44	6:45	2	73.69
2:02:36	2:09:26	2:17:31	2:24:08	2:30:45	2:37:20	2:43:55	2:50:32	2:57:11	3:03:50	3:10:34	3:17:16	3:24:28	3:32:21	3:39:08	3:45:47	3:52:28	3:59:08	4:05:45	3	72.94
6:33	6:50	8:05	6:37	6:37	6:35	6:35	6:37	6:39	6:39	6:44	6:42	7:12	7:53	6:47	6:39	6:41	6:40	6:37	4	70.91
2:06:34	2:13:09	2:20:57	2:27:38	2:34:23	2:41:24	2:48:15	2:54:48	3:01:18	3:08:13	3:16:08	3:22:49	3:29:21	3:35:59	3:42:36	3:49:09	3:55:40	4:02:05	4:08:16	5	68.86
7:32	6:35	7:48	6:41	6:45	7:01	6:51	6:33	6:30	6:55	7:55	6:41	6:32	6:38	6:37	6:33	6:31	6:25	6:11	6	66.26
2:07:17	2:14:30	2:23:37	2:30:29	2:37:40	2:44:36	2:51:37	2:58:36	3:05:33	3:12:29	3:19:21	3:26:15	3:33:16	3:40:18	3:47:15	3:50:09	4:01:09	4:08:06	4:15:23	7	65.23
7:59	7:13	9:07	6:52	7:11	6:56	7:01	6:59	6:57	6:56	6:52	6:54	7:01	7:02	6:57	6:54	7:00	6:57	7:17	8	65.18
2:05:58	2:16:56	2:24:05	2:32:51	2:43:19	2:50:20	3:57:17	3:04:18	3:11:12	3:18:19	3:25:15	3:32:19	3:44:38	3:52:04	3:59:06	4:06:18	4:13:25	4:20:54	4:22:58		
6:47	10:58	7:09	8:46	11:28	7:01	6:57	7:01	6:54	7:17	6:56	7:04	12:19	7:26	7:02	7:12	7:07	7:29	7:04		
2:17:56	2:25:32	2:33:05	2:40:32	2:47:55	2:55:18	3:02:34	3:09:58	3:17:13	3:24:33	3:31:51	3:39:10	3:51:01	3:58:58	4:05:47	4:12:32	4:19:18	4:26:18	4:33:18		
8:13	7:36	7:33	7:27	7:23	7:23	7:16	7:24	7:15	7:20	7:18	7:19	11:51	7:57	6:49	6:45	6:46	7:00	7:00		
2:23:07	2:30:32	2:37:55	2:45:20	2:52:48	3:00:14	3:07:35	3:14:56	3:22:18	3:29:38	3:37:02	3:44:25	3:51:44	3:59:11	4:08:12	4:15:33	4:22:53	4:30:12	4:37:29		
7:23	7:26	7:23	7:25	7:28	7:26	7:21	7:21	7:22	7:20	7:24	7:23	7:19	7:27	9:01	7:21	7:20	7:19	7:17		
2:05:49	2:17:59	2:24:48	2:31:44	2:38:42	2:46:52	2:53:49	3:00:42	3:07:54	3:15:21	3:22:17	3:40:15	3:47:21	3:54:34	4:01:43	4:09:14	4:21:50	4:29:19	4:37:43		
9:53	12:10	6:59	6:56	6:58	8:10	7:57	6:53	7:12	7:27	6:56	7:58	7:16	7:13	7:09	7:31	12:36	7:29	7:24		
3:04:41	3:13:14	3:21:42	3:30:04	3:38:16	3:46:23	3:56:24	4:04:41	4:12:58	4:21:14	4:40:11	Out—broken gearshift lever mis sing									
15:14	8:33	8:28	8:22	8:12	8:07	9:01	8:17	8:17	8:16	8:57	Out—broken gasoline tank									
1:53:02	2:01:14	2:07:34	2:13:50	2:20:08	2:26:28	2:34:26	2:40:56	3:07:57	3:14:15	3:14:15	Out—broken gasoline tank									
6:13	8:12	6:20	6:16	6:18	6:20	7:38	6:30	7:01	6:18	8:57	Out—broken gasoline tank									
2:28:12	2:35:43	2:43:13	2:50:44	2:58:12	3:05:40	3:14:27	3:14:27	3:14:27	3:14:27	3:14:27	Out—broken gasoline tank									
7:31	7:31	7:30	7:31	7:38	7:28	8:47	7:01	7:01	7:01	7:01	Out—broken gasoline tank									
2:18:01	2:25:57	2:33:27	2:41:07	2:48:47	2:56:27	3:04:07	3:11:47	3:19:27	3:27:07	3:34:47	Out—broken gasoline tank									
8:51	7:56	7:30	7:40	7:50	7:40	7:50	7:40	7:50	7:40	7:50	Out—broken gasoline tank									

In this race seven were allowed to finish. Behind De Palma and Anderson came Mulford in the Boillot Peugeot, which ran into third place, less than 3 minutes behind the winner. Mulford had to nurse the car, for he finished with a cracked frame, evidently the result of the accident to Boillot at Indianapolis. Oldfield in a Stutz was fourth, Chandler in the Braender Bulldog fifth, Heinemann in a Marmon sixth and Dearborn in a Stutz seventh.

Although beaten by De Palma and the Mercedes, still the Stutz car has much to be proud of, for it made an enviable record. All three Stutz cars finished and the hood never was lifted on one of them. Anderson changed only one tire, while Oldfield and Dearborn, the latter driving the private entry of William Ziegler, went through without a single change of tire equipment.

Saturday's Race a Wonderful Battle

The race for the Elgin National Trophy the second day might well be classed as one of America's greatest road battles. In the first place it brought out the largest field that ever lined up before Starter Fred Wagner, and although it was slower throughout than the previous day's battle, still this was more than made up by the see-sawing of the leaders. As usual, Wishart went out in front but this time he did not open so big a gap, while thundering at his heels were Pullen in the Mercer, Burman in the Peugeot, Alley in the Duesenberg and De Palma in the Mercedes. The winner of Friday's race was back in the ruck for a considerable distance and it was the elimination of those in front of him that gave him his opportunity to become the winner of the 2 days' racing.



Bob Burman in his Peugeot led for many laps, but went out with a cracked cylinder



One of the eight telephone stations around the course which sent news of passing cars to the scoreboard

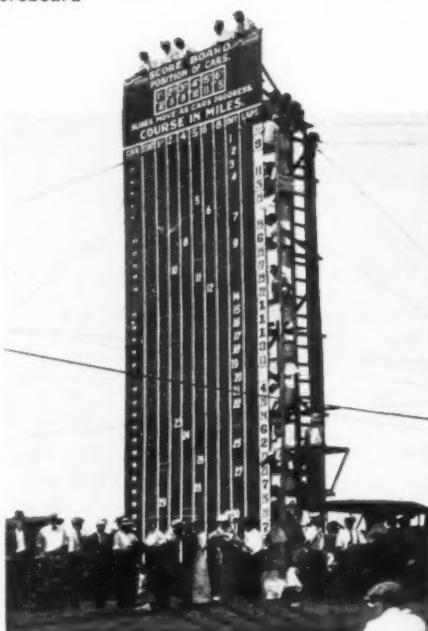
Wishart's accident gave those immediately behind him their chance and, following the fatal thirteenth lap, Burman in the Peugeot went into the lead. When Burman started in the morning he did not expect to be able to go more than a few laps because of the weak condition of the cylinder which cracked at Sioux City. But it held up surprisingly well and as long as it was in commission Burman was a factor. He blazed the way for the others for many laps, with Tom Alley in the Duesenberg and Pullen in the Mercer barking at his heels. Alley was particularly aggressive and brought his car up to within a few seconds of the Peugeot. Then Rickenbacher, who had been eliminated earlier, slid into the seat and he drove so furiously that he was the leader following a stop at the pits for supplies by Burman. A little later, though, a broken driveshaft stopped him and this left the way clear for DePalma, who with Pullen, had passed Burman when the latter stopped at the pits.

It was a ding-dong battle at this stage of the race. Any one of four cars could win. Burman, though, quit with only a lap and a half to go when the weak cylinder went wrong.

Pullen's Sensational Fight

For the second time at the meet DePalma went into the last lap with only a slight advantage. Pullen, who went through the entire race without a stop, was dogging his heels, ready to take advantage of any slip and had a fighting chance all the way to the last lap. DePalma, however, maintained his advantage and went over the line with a margin of 1 minute and 10 seconds over Pullen. The performance of the latter driver was remarkable indeed. In a much smaller car than Wishart's he always was a factor and went through the entire race without a stop.

Third in this race was the veteran Barney Oldfield who was fourth in Friday's race and who was remarkably consistent in both events. Gaston Maurice in the Sunbeam ran fourth. Eddie Hearne in the Burman Special was the last to get the checkered flag, being placed fifth. Also running at the finish were Carlson in the Maxwell and Henning in the Mercer.



Pendleton scoreboard at grandstand. White numbers at right show number of laps each car made. Other numbers show the different cars and the eight vertical columns show their position around the course

Summary of Results of For

1910

Race	Car
Elgin National	Lozier
Illinois Cup	National
Kane County Cup	Marmon
Fox River Cup	Benz

1911

Elgin National	National
Illinois Cup	National

1912

Free-for-All	Mercedes
Elgin National	Mercedes
Illinois Cup	Stutz
Aurora Cup	Mercer
Jencks Cup	Mason

1913

Chicago A. C.	Mercer
Elgin National	Stutz

DePalma has driven in four of the five Elgin meets, starting first in 1911, when he drove a Simplex, failing to finish.

The fastest lap the first day was 6:11, a mark at which two tied—Wishart and Mulford. Hung up for this was a \$200 purse given by Martin J. Kavanaugh of the Chicago Automobile Club. On the second day Wishart carried off the honor with 6:20 3-5, made on his second lap.

DePalma Wins \$4,400

DePalma won \$4,400 in all, \$2,000 for each first and \$400 from the Rudge-Whitworth company for using its wire wheels. Pullen gets \$800, which includes the Rudge-Whitworth \$100 for second place. Anderson lands \$700 for second the first day; Mulford, third the first day, picks up \$300 for first and divides the Kavanaugh prize. Oldfield won \$300 for being third the second day. Wishart's winnings included the \$200 for Saturday's fastest lap, given by Harry Vissoring, president of the Chicago Automobile Club.

Their Fastest Laps on Friday

Car	Driver	Lap	Time
Mercer	Wishart	2	6:11
Peugeot	Mulford	36	6:11
Stutz	Anderson	12	6:27
Mercedes	DePalma	3	6:29
Marmon	L. Heinemann	13	6:35
Gray Fox	Wilcox	17	6:38
Braender B'ld'g	Chandler	17	6:39
Duesenberg	Tom Alley	6	6:41
Mercer	Pullen	6	6:42
Stutz	Oldfield	21 & 28	6:52
Stutz	Dearborn	2	7:02
Maxwell	Tetzlaff	6	7:08
Duesenberg	Rickenbacher	1	7:11
Maxwell	Carlson	5	7:15
Mercer	Luttrell	17	7:25
Sunbeam	Maurice	7	7:28
White	Shrunk	13	7:34
Sunbeam	Grant	2	7:44

For mer Elgin Road Races

Driver	Miles	Speed
Mulford	305	62.5
Livingston	203	60.6
Buck	169	55.1
Hearne	135	54.1

Zengel	305	66.45
Herr	203	65.63

DePalma	305	68.9
DePalma	254	68.4
Merz	203	65.6
Hughes	152	60.57
Endicott	101	60.57

DePalma	305	66.8
Anderson	305	71.5



Henning in Mercer with which Wishart's car locked wheels on Saturday resulting in the accident. Note the militia guard

Their Fastest Laps on Saturday

Car	Driver	Lap	Time
Mercer	Wishart	2	6:20 3-5
Mercedes	DePalma	10 & 34	6:28
Duesenberg	Tom Alley	27	6:34
Puegeot	R. Burman	4 & 11	6:37
Gray Fox	Wilcox	14	6:41
Stutz	Anderson	2 & 18	6:42
Mercer	Pullen	29 & 33	6:45
Sunbeam	Grant	3	6:46
Duesenberg	Rickenbacher	6	6:47
Stutz	Oldfield	8 & 12	6:48
Maxwell	Carlson	6	6:48
Braender B'ld'g	Chandler	5	6:50
Marmon	Heinemann	15	6:56
Maxwell	Tetzlaff	6	7:00
Lozier	Fontaine	3	7:02
Sunbeam	Maurice	29	7:04
Stutz	Dearborn	6	7:09
Marmon	D'Alene	3	7:14
Lurman Sp.	Hearne	35	7:23
Mercer	Henning	20	7:24
Pahys	M. Roberts	2	7:29
Chadwick	Burt	4	7:29
Maxwell	Tom Orr	5	7:45
Keeton	Caillaghan	3	8:17
White	Cailloutte	1	8:29
Great Western	Tidmarsh	1	10:01



Tom Alley in No. 12 Duesenberg which made a plucky fight

The Winning of
the C. A. C. CupThe Battle Between DePalma and
Anderson—A 44-Second Victory

IT is 11 o'clock on Friday and twenty cars are lined up in front of the expectant grandstand in ten rows of two each to battle for the Chicago Automobile Club Cup

Six cars that were nominated for the race have been withdrawn. Bob Burman is a spectator, his Peugeot having sustained a broken cylinder the day before. Mel Stringer, slated to drive the No. 7 Marmon, is in the pits with his arm in a sling and his car is in the garage, wrecked by a spill in practice. The No. 18 Marmon is another absentee, being ruled out by the technical committee because its piston displacement exceeded 450 cubic inches. No reason is given for the withdrawal of the No. 23 Maxwell and the No. 32 Keeton. The No. 33 Peugeot is far from the scene of the struggle, its owner, E. J. Schroeder, refusing to ship it from New York on hearing that DePalma would not drive it.

Bang—They're Off!

A bomb explodes in midair and twenty mechanics are at the cranking handles of the cars. Exhausts pop petulantly and the smoke is blinding. Engines roar a challenge. Starter Wagner starts to toll off the seconds. Gears rattle. The crowd breaks out in a cheer as Dearborn and Tetzlaff are sent away. The second annual race for the Chicago Automobile Club Cup is on.

The Great Western, driven by Tidmarsh, fails to complete even one lap, engine trouble eliminating it before the motor is fairly warmed up to its task.

Mulford's Peugeot leads on corrected time, having reeled off the first 8.38 miles in 6 minutes and 27 seconds. Wishart's time is but 2 seconds slower. It is evident that all records for the Elgin course are to be shattered.

Wishart is a dangerous competitor, however, for the Mercer covers the second lap in 6 minutes 11 seconds.

Two cars are eliminated after making three laps, Rickenbacher docking the Duesenberg with a broken gearshift lever, and Grant, his trousers' legs covered with grease, abandoning the Sunbeam with a broken oil line.

Wishart leads DePalma by 2 minutes, and so close is the

struggle that Anderson, in eighth place, is only 5 and a fraction minutes abast the yellow pacemaker.

In the next five laps three more cars are eliminated, Tetzlaff's Maxwell, Pullen's Mercer and Maurice's Sunbeam.

The fourteenth lap proves disastrous for both Alley and Carlson. The Duesenberg is abandoned with transmission trouble, and a refractory motor results in the elimination of the Maxwell.

Otto Henning, driving the No. 26 Mercer, quits the race after covering twenty-two laps, encountering engine trouble. Wishart stops for a second time on the twenty-third lap to tighten the gasoline tank, which has been jolted loose. He loses only 1 minute and 10 seconds in making the repairs, and at the completion of 200 miles has a lead of more than 6 minutes on DePalma.

Engine trouble eliminates Roberts' Pahys on the twenty-fifth lap. On the same circuit DePalma blows a tire on the back stretch and stops twice, once at the side of the course to change casings and once at the pit to take on a spare.

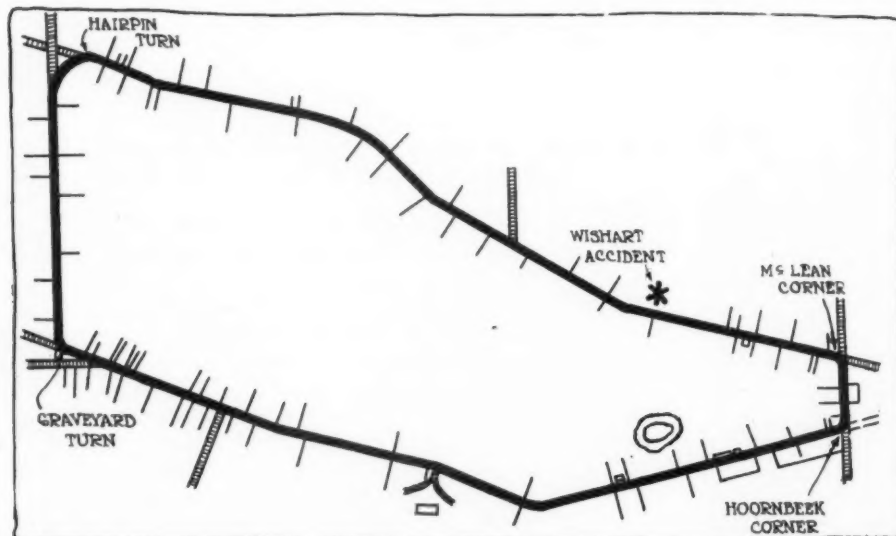
Although leading by a wide margin, it can be seen that Wishart is in trouble. His gasoline tank is leaking badly as he passes the stands, and on his twenty-sixth lap he stops for more than 2 minutes in a futile endeavor to strap on the tank. One more circuit of the course and Wishart is forced to abandon the Mercer in disgust.

At the time of Wishart's withdrawal Anderson has passed DePalma, and with the Mercer no longer a contender, the Stutz is leading the Mercedes by 39 seconds. Mulford is in third place; Oldfield, fourth; Chandler, fifth; Heinemann, sixth, and Dearborn, seventh.

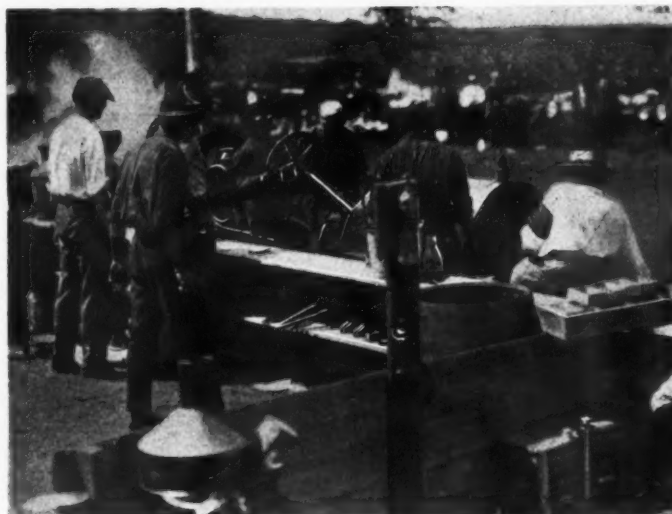
On the twenty-eighth lap DePalma cuts down Anderson's lead to 26 seconds, but on the next circuit of the course the Stutz driver more than makes up the ground lost and has an advantage of 1 minute 4 seconds when he crosses the tape. Anderson loses a minute changing a rear tire on the thirtieth lap, and with but six more laps to go is only 23 seconds in front of the desperately driving Italian.

DePalma to the Front

On the thirty-first lap DePalma passes Anderson and assumes a lead of 44 seconds. On the next lap he increases this to 52 seconds, but does not gain or lose a second on the thirty-third circuit. DePalma has a friction over a minute to spare at the completion of the thirty-fourth lap, but so desperately does Anderson drive the last 16 miles that DePalma gets the checkered flag only 44 seconds before the Stutz pilot finished the most gruelling race in the history of the Elgin speed carnival.



Map of the Elgin course on which Friday's and Saturday's races were run. Cross shows point at which Wishart's accident occurred



One of the scenes at the pits. Henning's Mercer in the foreground

Capturing the Elgin National Trophy

Wishart Was Leading Till 14th Lap

—DePalma Wins Duel With Pullen

A HIATUS of 24 hours—a busy hiatus of tearing down and reassembling speed creations—and twenty-eight cars, the largest field that has ever faced a starter in an American road race, have answered the call of the clerk of the course and are awaiting the bomb that will start the struggle for the Elgin National Trophy.

Thirty-two cars originally were nominated, but four are missing—the No. 3 Duesenberg, the No. 7 Marmon, the No. 20 Peugeot and No. 23 Peugeot. Two, the Duesenberg and No. 20 Marmon, have spent their strength in the race of the day before and consequently will not start.

As on the previous day the cars are lined up in rows of two each and are sent away at 30-second intervals.

Wishart, forced out of the race of Friday with victory almost in his grasp, shows his car no mercy, and although running in eleventh position, is first on corrected time, having made the first 8.36 miles in 6 minutes 31 seconds. Burman takes 6 minutes 43 seconds to cover the initial lap and DePalma's Mercedes is only 1 second slower.

Fontaine, Burman, Dearborn and Pullen flash by the stands in the order named for a second time, but Wishart, traveling at a speed of 78.5 miles an hour, is announced as the leader.

On the third circuit of the course Burman passes Fontaine and moves up into the position of pacemaker, with Fontaine, Pullen, Dearborn and Rickenbacher taking his smoke. On corrected time Wishart is leading Anderson by 50 seconds and is driving like a madman to overtake and pass Burman.

On the fourth and fifth laps Burman is successful in throwing off Wishart's challenge. The Mercer is hanging onto the Peugeot with the tenacity of a bulldog, however, and it seems only a question of minutes un-

EQUIPMENT USED ON CONTESTING CARS IN ELGIN RACES

Car	Driver	Magneto	Plugs	Carbureter	Oil	Tires	Wheels
Stutz	Dearborn	Bosch	Bosch	Rayfield	Monogram	Firestone	Wood
Stutz	Oldfield	Bosch	Bosch	Schebler	Monogram	Firestone	Houk
Stutz	Anderson	Bosch	Bosch	Schebler	Monogram	Silvertown	Houk
Duesenberg	Rickenbacher	Bosch	Bosch	Schebler	Oilzum	Riverside	R. W.
Duesenberg	Alley	Bosch	Bosch	Schebler	Oilzum	Riverside	Wood
White	Shrunk	Bosch	Bosch	White	Polarine	Braender-Michelin	Wood
Mercedes	DePalma	Bosch	Bosch	Mercedes	Monogram	Nassau	R. W.
Maxwell	Tetzlaff	Bosch	Bosch	Harroun	Polarine	Silvertown	Houk
Maxwell	Carlson	Bosch	Rajah	Harroun	Polarine	Silvertown	Houk
Marmon	Heinemann	Bosch	Bosch	Schebler	Monogram	Palmer Cord	Wood
Gray Fox	Wilcox	Bosch	Bosch	Rayfield	Castor	Silvertown	R. W.
Sunbeam	Grant	Bosch	K. L. G.	Master	Castor	Palmer Cord	Steel
Sunbeam	Maurice	Bosch	K. L. G.	Master	Castor	Palmer Cord	Steel
Great Western	Tidmarsh	Bosch	Bosch	Schebler	Oilzum	Braender	Houk
Braender Bull Dog	Chandler	Bosch	Bosch	Rayfield	Oilzum	Braender	Dunlop
Mercer	Henning	Bosch	Bosch	Rayfield	Castor	Silvertown	R. W.
Mercer	Wishart	Bosch	Bosch	Rayfield	Castor	Palmer-Silvertown	R. W.
Pahys	Roberts	Bosch	Bosch	Rayfield	Oilzum	Michelin	Wood
Peugeot	Burman	Bosch	Bosch	Master	Castor	Nassau	R. W.
Burman	Hearne	Bosch	Bosch	Master	Castor	Nassau	R. W.
Mercer	Pullen	Bosch	Bosch	Rayfield	Castor	Palmer	R. W.
Marmon	D'Alene	Bosch	Bosch	Rayfield	Monogram	Silvertown-Riverside	
Peugeot	Mulford	Bosch	Rajah	Rayfield		Braender	
Chadwick	Hoskins	Bosch	Rajah	Rayfield		Firestone	Houk
Keeton	Callaghan		Bosch	Rayfield	Polarine	Nassau	

til it will pass the French car. Anderson, who is pushing Wishart, is forced to stop at the pit to repair a leaking radiator cap, and loses almost 4 minutes before he gets away again.

At the end of 50 miles Wishart has a lead of 1 minute 5 seconds on Burman and is driving at a rate of 75.1 miles an hour.

Eight cars have been eliminated at this stage of the struggle. Mercedes Fritz Walker has failed to complete one lap of the race and has docked his Rae with a broken clutch. A broken connecting-rod has retired Tidmarsh's Great Western on the second lap, and a broken radiator has disabled Luttrell's White. Engine trouble encountered on the third lap caused the retirement of Caillouette's White. D'Alene, in rounding Hornbeek's turn on the fourth lap, crashed into a tree and broke the frame and radiator of his Marmon. Mort Roberts abandoned the Pahys with a faulty motor on the fifth lap, and Orr voiced a similar complaint about his Maxwell on the next circuit of the course. Early in the race Callaghan was ordered out on account of the Keeton's bad brakes.

At the completion of twelve laps, or 100 miles, Wishart has

increased his lead over Burman to 3 minutes and a fraction. Alley's Duesenberg is third; Pullen's Mercer, fourth; DePalma's Mercedes, fifth, and Grant's Sunbeam, sixth.

Five more cars were docked disabled before the 100-mile mark was reached. Rickenbacher's Duesenberg suffered from engine trouble on the seventh lap; the Chadwick was withdrawn because of engine trouble, and the Braender Bulldog caught on fire on the eighth lap; the Lozier broke a wheel on the tenth lap, and engine trouble eliminated Tetzlaff on the eleventh lap.

Burman Takes the Lead

The accident that cost Spencer Wishart his life on the fourteenth lap gives Burman an opportunity to take the lead once more, and at the completion of the eighteenth lap, or with the race half over, the speed king is leading by 1 minute 1 second, with Alley in the Duesenberg chasing him. Pullen in the Mercer is third and DePalma in the Mercedes is fourth, 5 minutes behind the new leader. A stop for gasoline and oil on the seventh lap, DePalma's only stop in the 301 miles, has cost him 55 seconds.

Anderson, a dangerous competitor early in the race, goes out on the twentieth lap, due to radiator trouble. Heinemann's Marmon is rolled to the grass with disabled brakes on the twenty-first lap and the Gray Fox, Grant's Sunbeam and Dearborn's Stutz are withdrawn on the twenty-third lap, all three cars suffering from balky motors.

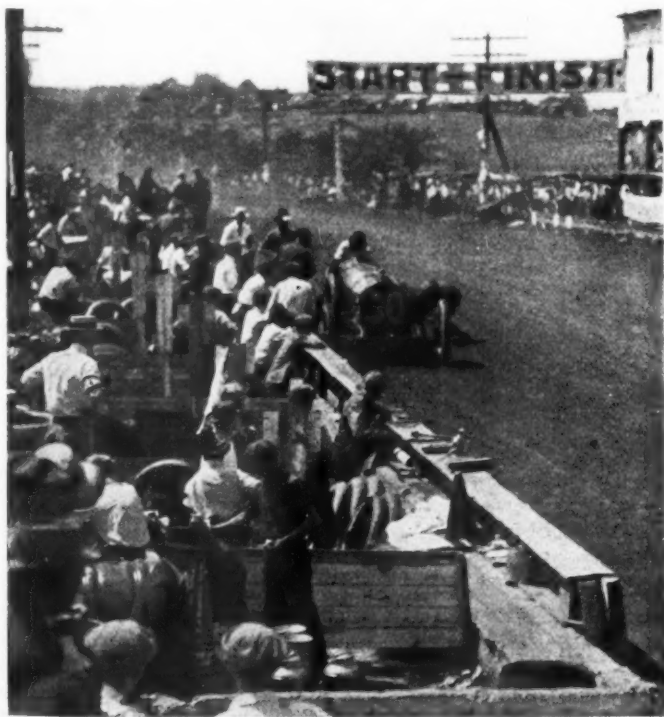
Alley stops for fuel on his twentieth lap and is relieved by Rickenbacher, who steps on the throttle and sends the Duesenberg in pursuit of Burman.

Five times Rickenbacher passes the grandstand, gaining a few seconds on each lap. The distance between the Peugeot and Duesenberg is gradually and slowly cut down until at the end of the thirtieth lap Rickenbacher has passed Burman and is leading the closely bunched field by 1 minute 13 seconds.

DePalma and Pullen's Fight

Rickenbacher shows the way to the field for two more laps. With only 33 miles more to go, a driveshaft on the Duesenberg breaks and Rickenbacher and his mechanic walk to the pits, eliminated at the very dawn of their hour of triumph.

The withdrawal of Burman's Peugeot leaves DePalma and Pullen alone on the course to fight for the nerve-racking victory. At the start of the thirty-fifth lap DePalma has a lead of only 47 seconds on Pullen, who has not stopped once since he was sent away at 11 o'clock. The Italian has the faster car, however, and increases his lead to 55 seconds on the next to the last circuit. Pullen, after getting the green flag, urges the yellow Mercer to the limit of its speed, but the chase is a hopeless one and DePalma thunders over the line a victor by 1 minute 10 seconds.



A scene at the pits on Saturday. Heinemann's Marmon making a tire change before the pits

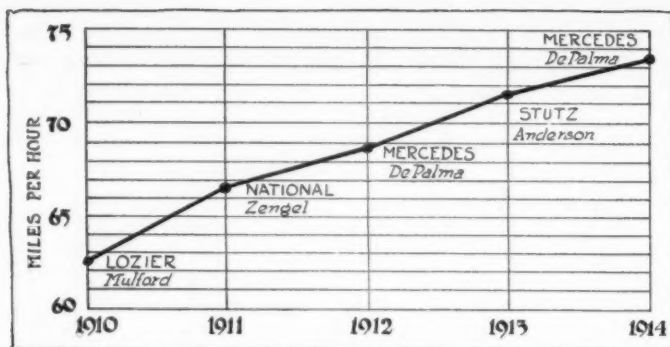


Chart showing the increase from year to year in the speed made in the Elgin National Trophy Race

Fast Team Work Lacking at Pits

Inadequate Preparation and Training of Crews Evident in Many Cases

THE 2 days of racing on the Elgin course were enlivened by eighty-eight pit stops. Forty-seven of these were made on Friday during the races for the trophy of the Chicago Automobile Club and forty-one on the following day. Out of these stops it was noticeable that a relatively small percentage were due to tire trouble as compared to other races. On the first day there were but sixteen stops for tires and on the second day, seventeen.

The fast team work at the pits which characterized the 500-mile Indianapolis race seemed to be lacking in the Elgin events. The tire changes were slow, even though demountable wheels were used and it did not seem as if the work of exchanging wheels had been sufficiently rehearsed. The Mercer, Stutz and Maxwell pits were exceptions to this rule, being manned by experienced crews.

Short Time at Pits by Some Cars

One of the features of the race was the short time spent at the pits by some of the cars. The three Stutzes all finished the race on the first day without having their bonnets lifted and the only tire changed by this team during that day was one on Anderson's car. Pullen ran his Mercer through the entire free-for-all without making a single stop.

Taking up the race on Friday for the Chicago Automobile Club Trophy, DePalma found it necessary to halt only three times in his 301-mile ride to victory. The total time lost at the pits was but 1 minute and 29 seconds. This was rather unexpected as it was the opinion of the railbirds that the winner would be held up at least 3 minutes at the pits, based on experience of former years.

Anderson Lost Needlessly

Anderson, who finished second, only 44 seconds behind DePalma, lost first place through the fact that he was not thoroughly familiar with the rules by which the race was governed. He lost a spare tire on the track and fearing to be disqualified he sent his mechanic back after the tire. This delay cost him 7 precious minutes during which time DePalma gained a lead.

The total time at the pits was 2 minutes 18 seconds but with 7 minutes lost on the back stretch the time stopped totaled 9 minutes 18 seconds.

Ralph Mulford in the Peugeot made three stops at the pits. This total stoppage at the pits was 4 minutes 54 seconds.

Barney Oldfield in the Stutz No. 11 halted only once in the 300 miles. This became necessary at the end of 160 miles when he stopped on the 19th lap for gasoline and oil. He

was away in 1 minute 15 seconds. Oldfield did not change a tire during the event.

Chandler who drove his Braender Bulldog into fourth place made four stops at the pits changing seven tires and losing 10 minutes, 26 seconds in all at the pits. The pit work in Chandler's pit was very slow, particularly on the tire changes, and his running time could have been shortened quite considerably by some lively and heady work on the part of his assistants.

Heinemann in the number 30 Marmon who finished sixth lost considerable time at the pits, the chief trouble being the difficulty in keeping the spare tires tight.

He consumed 11 minutes 21 seconds at the pits in his five stops.

Stutz Drivers Did Not Lift Hoods

The Dearborn Stutz No. 1, which finished in seventh place, lost only 2 minutes, 31 seconds at the pits. Dearborn did not change a tire and, like the other Stutz drivers, never lifted the hood.

Wilcox's Gray Fox, which ran eighth, halted but three times, twice on account of valve trouble, the total time lost being 9 minutes 24 seconds.

Spencer Wishart, whose career was ended in the next day's event, was up in the lead for the first 190 miles but he was put out of the running by his gas tank becoming loosened by vibration. He lost considerable time trying to fix it up and finally withdrew in his 27th lap.

Pullen was well up for the first 10 laps until he went out on account of transmission trouble.

Pit Stops in Saturday's Race

DePalma made but one stop in the Saturday event and this was after he had gone 17 laps, taking 55 seconds to replenish his gasoline supply. DePalma changed no tires during the Free-for-all race and was riding on the same front tires that carried him through the event of the day before.

Pullen in the little Mercer holds the record for the 2-day's Elgin races as he was the only one to finish either day without making a stop of any kind. This he did Saturday.

Barney Oldfield halted at the pits five times but in none of them did he change a tire or lift the hood. All the stops were occasioned by taking on supplies of gasoline, oil and water, the last three being for water alone. His total time lost at the pits was 6 minutes 45 seconds.

Gaston Maurice, who piloted his Sunbeam to fourth place, stopped only once at the pits and this was to put a new spare on the rack to replace the one used on the tire change on the back stretch. He was away again in less than a minute and drove the final 140 miles without a halt.

The Burman Special with Eddie Hearne at the wheel drew up at the pits twice, both times to fill the gasoline and oil tanks and the radiator. The hood was not lifted at the pits and no tires were changed. The first stop occurred after 176 miles had been covered and the last one after 250 had been negotiated. His time lost at the pits was 2 minutes 55 seconds.

Carlson Has High Record for Stops

The Maxwell with Carlson at the wheel had only three laps to go when the finish flag put an end to the race. Carlson stopped more often than anyone else among the contenders. He stopped seven times in all and lost 12 minutes.

Bob Burman in the Peugeot had only two laps to go when he was put out on account of engine trouble. He had driven a very consistent race when he made only one stop at the pits. This was for gasoline and oil in the 32nd lap.

Wishart was in the lead in the number 19 Mercer when his fatal accident occurred in the 13th lap. He had not made a stop.

Anderson finished 19 laps without a stop when he was put out of the race with transmission trouble.

Rickenbacher went out in the sixth lap with a cracked cylinder and then drove the mount of his team-mate Alley until it went out with a broken drive shaft in the 32nd lap.

Tires Make Fine Record—Only 33 Stops on Two Days

UNPARALLELED in the history of the Elgin road races is the tire victory of this year's contests held last Friday and Saturday. Although in previous races the winning cars came through with comparatively few tire changes, this year shows a smaller number of tires per car than any other year, and the record stands above those made at Sioux City and other dirt courses in the country. Both contests this year showed a total of thirty-three tire changes and, with forty-eight cars on the course on both days, an average of less than a tire per car. Sioux City cannot boast of such a record, for in the 300-mile race just held twenty-one casings were replaced in the one race. Indianapolis, with its 500-mile classic, burned up more than \$10,000 worth of tires in the race of last May.

Pullen's Remarkable Record

Some individual showings are of special interest. Barney Oldfield and Dearborn, both in Stutz cars, finished Friday's race without a single tire change, and on Saturday DePalma, the winner, not only went through without a change but used the same front tires which he used on the day previous. Oldfield and Dearborn used Firestone tires, and DePalma used Nassau casings. Still more remarkable than the showings mentioned is that of Ed. Pullen, who went through the entire race without a stop and without using his spare tire. Considering the heat of the day, the record speed and the condition of the course, the showing of Pullen, who rode on Silvertown cord tires, is to be compared only with that of Ralph Mulford's in the 1913 500-mile race. Mulford completed the grind driving a Mercedes, the heaviest car in the race, without making a single tire change. When compared with previous Elgin races this year's contests show a very low average per car for tires.

Tire Changes in Friday's Race

The first stop of the day for tires was made by Tom Alley who came in for a stop of more than 1 minute to change a right front.

Mulford came in again on his eighteenth lap with a tattered right rear which required 1 minute 30 seconds to replace, considerable time for a tire change when it is considered the record is something like 15 seconds.

In his 25th lap DePalma stopped at the pits for a spare tire, being his only change for the day. He was followed closely by Wishart who took on two spares which required 2 minutes 8 seconds and almost at the same time Mulford came in for a right rear. The last stop of the race for tires was made by Roberts in the Pahys who, after changing a right rear, discovered his gasoline tank was leaking and abandoned the race.

So, like the Sioux City race, the Elgin races showed that tire makers are not asleep and that speed contests have taught them much in the building of casings which can stand up under severe strains, heat and abrasion.

It was a victory of tires, but the work at the pits when it came to changing casings was indeed poor and the miserable performances at some of the pits was due directly to poor tool equipment and at others to inexperienced and excited attendants. In many cases a pitman with a jack in his hand and staring at a blown out casing would remain still until told by five simultaneous shouts that the right rear needed replacement.

Billy Chandler's crew seemed to be the only one which had quick-acting lifting jacks. The others had ordinary jacks.

Not one of the pit managers took advantage of the extra supply of casings on the back stretch on the second day. It was arranged that a supply of casings, watched by an attendant, could be placed on the back stretch and then there would be no need of stopping at the pits for a spare or if the spare had blown to run to the pits on the rim.

Oversight was evident. Road races call for strong supports for the extra tire, yet many of the cars came in front of the grandstand with the spare tire or wheel loose. The holding straps almost completely off in one case. In another instance the spare was lost on the back stretch because of insufficiently strong holding material. Charlie Erbstein warned his man before the race the leather straps were not strong enough. Mr. Erbstein may not be a prophet but he must be given credit for predicting the loss of Heinemann's extra casing.

One more correction might be made with regard to the method of approaching the pits for a tire change. It seemed that many drivers gave little thought to the fact that room is necessary to swing a wheel and not a few with a right front or rear to change came almost flush with the pits. This meant pushing the car to give the attendant a little room to get the wheel off and it also meant a great loss of time.

In both day's races few front tires had to be replaced, the greatest number of changes being necessary on right rears.

Faster Work on Saturday

On Saturday the first stop for tires came after the first lap when Carlson, driving one of the Maxwells, stopped at the pits to take on a spare, the original spare having been used to replace a blown-out casing.

Tire changes at Chandler's pit were unusually fast, due primarily to pre-race training in spare and wheel-tire changes. Chandler's extra tire was taken on in less than 40 seconds and to bring out the speed of the whole crew, drivers changed positions, Mulford taking the wheel.

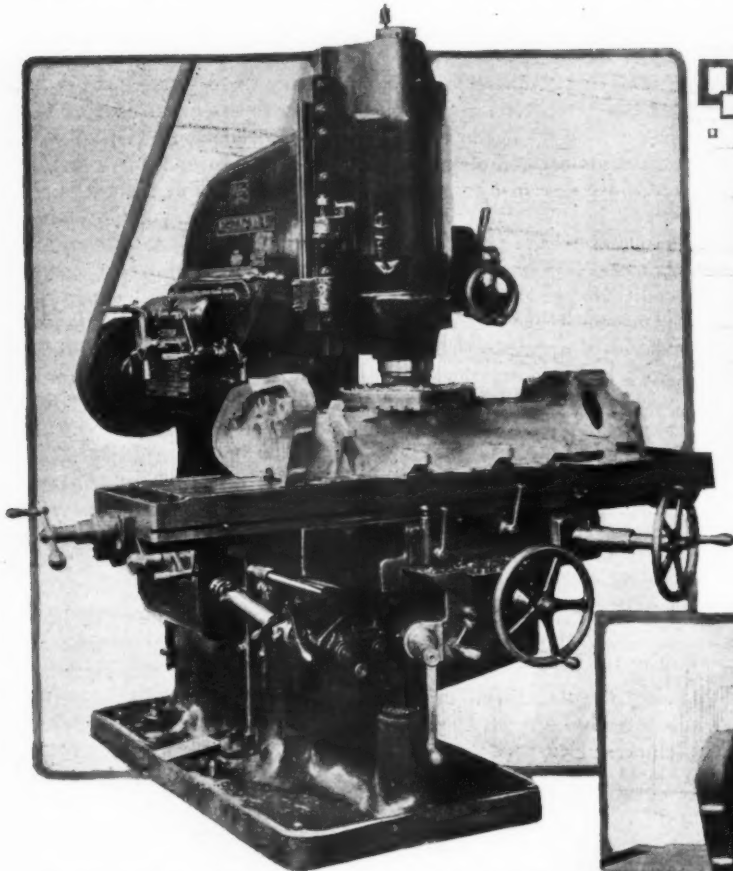
The last tire to be touched was the spare on Carlson's Maxwell which came loose at the end of the twenty-fifth lap and had to be tightened.



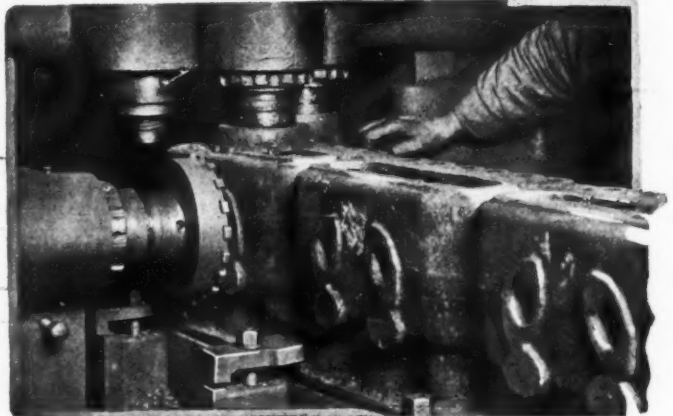
The Late Spencer Wishart

Spencer Wishart was 24 years old and had been racing since he was 18. His home town is Portchester, N. Y. He was married to Miss Louise McGowan, of Indianapolis, Ind., 2 months ago. He started by piloting cars owned by himself and finished second in the first race on the Indianapolis track. His work was a combination of daring and cool nerve, and soon he was called into the professional ranks and became the captain of a racing team for a manufacturer. On August 25, 1912, at Columbus, O., he broke the 75, 100, 150 and 200 mile track records. The first three are still standing. At the Santa Monica, Cal., races this spring he averaged 84.4 miles an hour before going out of the race. Funeral services were held on August 25 in New York City.

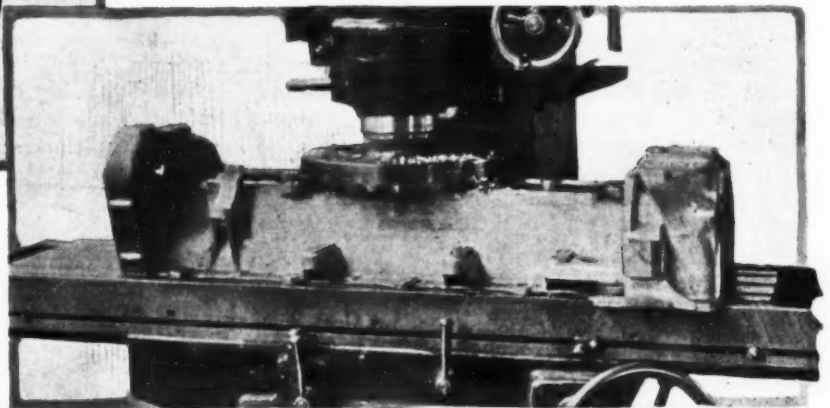
Cutter Life a Factor in Economy



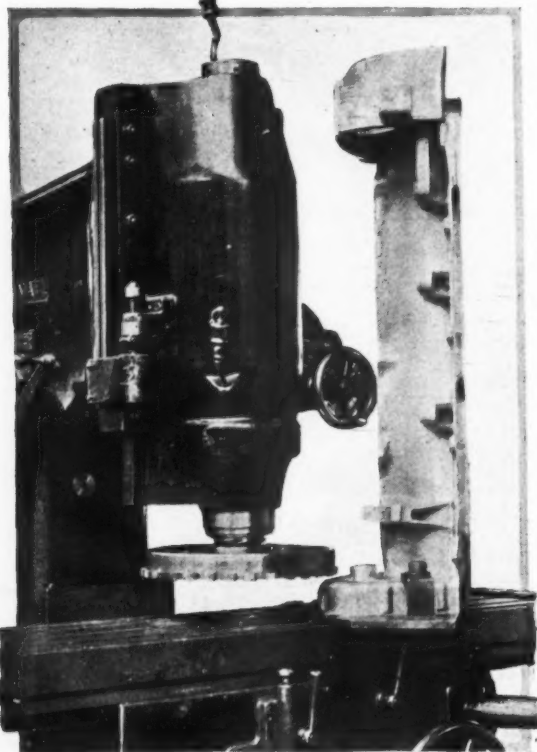
Tindel cutter milling a Continental six-cylinder crankcase



Cutters at work on the close-grain iron of Packard cylinders. The Packard Company states that, while the increased production has not appeared as a very great factor, owing to the close grain of the metal, the cutters last 20 to 25 per cent. longer without grinding



Milling the cylinder flange of a Continental six-cylinder crankcase



Milling the top and bottom faces of Continental crankcases

QUICK milling work is an essential feature in fast production methods in automobile plants. In the handling of cast iron it is desirable to have a fast feed on the machine and at the same time to have the life of the cutter as long as possible in order that the tool economy will be within the realms of reason.

The accompanying illustrations show the Tindel inserted tooth milling cutter in actual use in the plants of the Continental Motor Manufacturing Co. and the Packard Motor Car Co. In using these cutters in the Packard company's plant to mill very close-grained cast iron cylinders, the increased production has not appeared as a very great factor, but the Packard company states that it has found that the cutters stand up 20 to 25 per cent. longer without grinding.

Sometimes Table Feed Is 3.5 Inches per Minute

The table feed on the installation shown at the top right of this page is 2.5 inches per minute. The engineers of the Tindel-Norris company of Eddystone, Pa., makers of this machine, state that this can be easily exceeded and that there are cases where a 10-inch cutter is used to remove stock from cast iron with a rate of table feed of 3.5 inches per minute.

These tools operate on a semi-automatic principle and are thoroughly up to date as regards ease of handling. In the accompanying illustrations various steps in the milling of an aluminum crankcase are shown. The cylinder operation is for a Packard six.



Leaving Kretzy in the Russian military endurance trials, giving a good idea of the better class of roads in Russia

Russia—A Trade Opportunity

People Are Wary of Expense Attached to Ownership of Cars—Dealer is a Big Factor—Part II.

By the Late E. P. Batzell

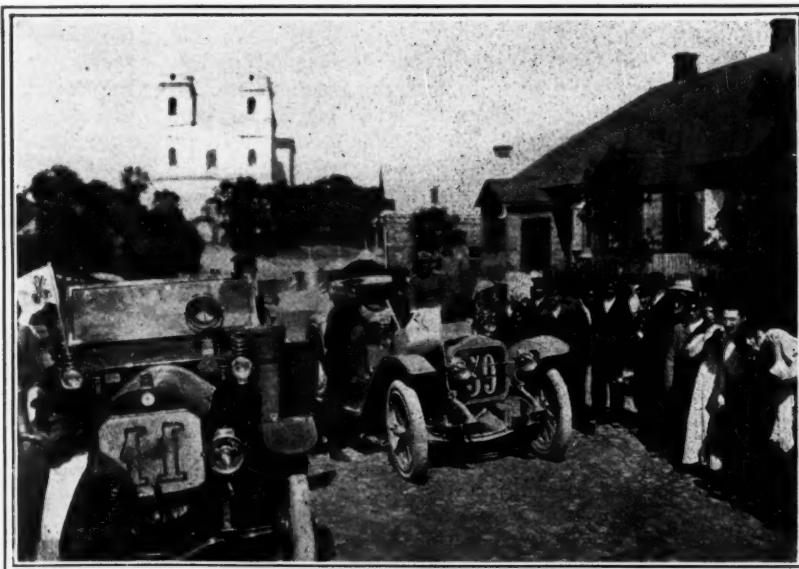
EDITOR'S NOTE.—This article was prepared some time ago by Mr. Batzell and so must be taken as a description of conditions in Russia at the outbreak of the great European war. THE AUTOMOBILE is indebted for the illustrations to The Autocar and to the White Company.

THE character and the value of a car naturally put the owner in a certain class as to the service which he can reasonably expect and claim from the agent and from the car. On the other hand, it is so in reality that the richer parties buying more expensive cars can be made to pay for service without making them notice it and without scaring them away from becoming and continuing as automobile owners. It is that class of people who begin their automobile ownership at the medium- and low-priced cars who need most efforts and service to become cultivated into satisfied and permanent motorists. Many of them are attracted towards the pleasure they have in view when owning a car. Others would like to use their cars also for some commercial purpose. But, anticipating a big outlay for the upkeep of the car and the chauffeur, they all start with the purchase of a comparatively inexpensive machine, although under normal conditions they could and would have bought a much better and more costly one. They are not quite sure if they will remain automobile owners for long, their first machine taking the rôle of a trial one. Thus they gain knowledge and experience at the risk of the cheaper machine and consequently at the risk of little money, figuring correctly, that all expenses might be somewhat proportionally lower with a smaller price paid for at the time of first purchase. If this class of people is not getting the proper treatment and if they don't see their expectations come true more or less, the latter being largely out of the competence of the agent, they are lost customers to the dealer who sold them the first machine and they might become disappointed enough to leave motoring entirely, at least for a time, until, according to their expectations, the automobiles are further advanced and improved.

It is a fact that the few existing cheap makes of cars on the Russian market cannot

boast of many repeated orders at the present when the owner would come back and dispose of his old machine to buy a new one of the same kind. The cases when such repeated orders have been taking place can be explained either by the cost of the particular machine being about all the owner really can pay, or that the use of the machine gives complete satisfaction. The latter generally happens very seldom if one uses it as a purely family machine; it is possible only if a commercial application is attached to it. The majority of automobilists who now buy the cheap grades of cars keep them only so long until they become more or less exacting as to features offered in them and until they obtain some automobile experience. Then they are prospects for better, more commodious and higher-priced machines.

Up to now the opportunity to try the use of an automobile with a limited outlay of money was very narrow on the Russian market, because one had hardly any choice of the cheap cars. Now their number and variety of types is gradually increasing, which means more competition between them



Part of third section of the Russian military trials stopping at Maljata



One of the cars in the Russian military trials on the road. Note poor road conditions

and consequently favors the buyer. That cheap cars are needed there can be readily seen from a few facts. The Ford has been practically the only type sold there since some years ago and which combines conventional automobile lines with a price much below that of medium European cars. Nevertheless now the lack of competition makes it possible there to sell a Ford touring car of the latest type for 2,375 rubles (about \$1,200), because people are buying it anyhow, and one could not sell enough of them for a lower price to make the same profit because only 1,000 cars are sold yearly in the whole country. However, judging from statements at the Ford branch the above price is to be reduced for next year, which is caused either by a bigger allotment of cars to be sold or by increasing competition of the other cheap cars gradually making their appearance on that market. It is characteristic of the market conditions to note and compare the rate of sales of the Fords with the distribution of other much more expensive machines. In some districts there are more cars of some particular high-priced European make in one town than there are Fords in the whole district, the latter being bigger than a state. For example, the whole southwest of Russia with a populace of some 20,000,000 absorbs with difficulty 120 Fords in a year, whereas Laurin & Clement sell as many cars just around the city of Kief, in that same district. The latter city proper has some 500 automobiles registered, in which number are only about a dozen Fords. It is true, however, that the Ford branch there has existed but a short time.

Abnormal Prices the Rule

The sale of Fords is a good example, demonstrating how people are buying cars and paying abnormal prices for them, as long as they get a machine which is cheaper than another of much better grade. The big factor of price with new buyers also can be seen in the quite large rate of business carried on by the Cyclonette type of vehicle. This three-wheeler is very popular in Germany, where it originated, and in Russia. It has been much improved in recent years, having a four-cylinder, air-cooled motor exposed and set in front above the driving wheel. It seats four or five passengers, is considered as an automobile and, being cheap, has gained quite a field for city use. It is used for private purposes and also commercially, notably as a sort of taxicab.

Considering transportation charges and duty in bringing cars into Russia, one should make good profit there in selling the average \$1,000 to \$1,200 car for the price asked for the Ford now, or a little higher. Big business would be assured, although it could come only gradually. A car resembling the high-priced machines, and which combines good quality with attractive service terms for the owners, should bring many repeated orders among the class of medium rich people

who can be satisfied and receive personal pleasure with an average car performance when there is not as much speed and luxury attached to it as in the better European cars of three times the price. To that class of people belongs the large mass of those who are no automobile prospects at the present, because they cannot afford to change cars quite often and stand much extra expense in that connection, but who would buy cars as soon as they are reasonably assured of their service ability without having to connect this feature with a high-priced car. Naturally, the efforts used to persuade them into buying cars are to be based on the evidence of favorable facts concerning the cars and their reputation among the users, which is very important.

Business Value Not Realized

The business man, the merchant, the doctor, etc., have not grasped as yet that the automobile is a contrivance not only for the pleasure of rich people, but that it can be used to a large part for their own business convenience. It seems that the European standard for the time factor in any transaction is to blame for the above. Things go much slower there and it is considered that a person is in haste if he rides in a hack. The cost of hiring or owning one of those is quite low, especially when securing one on a contract basis, for the daily needs of a doctor, contractor, etc. Although slow, the horse vehicle accomplishes its purpose satisfactorily, because the number of daily transactions and the distance to be traveled are generally much smaller than in the United States under the same conditions where an automobile would have been indispensable. Besides, the hired hack does not require any initial outlay, which is very important for the beginner in business, and it is free of the trouble one meets there in connection with the ownership of an automobile and with the chauffeur for the latter. People who are better off naturally own their horses and have hired drivers for them, but an outfit of good quality costs less than an automobile; the driver is not a privileged expert, but an ordinary peasant who is much easier ordered about than a chauffeur, and, most of all, one is not called upon by the fashion to change outfits every so often to keep pace with the rest, as in the case of automobiles.

Horse-Drawn Vehicles Predominate

At present in Russia one finds many instances of automobile use for business purposes, even heavy and light trucks, buses and delivery cars, aside from all those cars which are used by the government in many branches of civil and military activity. But their proportion to the horse-drawn vehicles of the same kind, except the buses, is very small. The large concerns which do much carting of heavy loads and where a number of trucks can be employed for

this purpose are gradually introducing them. They are able to maintain a large garage and repair shop where proper expert management can be easily installed without making things too costly for the firm, as would be the case with smaller concerns with a small number of machines. The latter naturally would be putting greater responsibility on the shoulders of their drivers and are obliged to use the service of a public garage and repair shop for every piece of work requiring facilities and skill. Trucks are giving better satisfaction in the larger business enterprises and where they are accompanied by a service guarantee of a properly equipped selling agency. The lack of department stores and other large individual concerns which have much hauling to do is also a reason why the commercial vehicle does not spread rapidly in Russia. On the other hand, the advent of the automobile for bus service has practically begun this type of locomotion there. The horse-drawn buses never have been used, except as stage coaches between towns or between the hotels and the depots. Now the larger cities have one or more regular bus lines installed for competition with the street car systems and also separately. These lines appear to work out quite satisfactorily. They have also supplanted some of the formerly existing stage-coach lines for the transfer of passengers and freight between commercially connected towns when the available railroad facilities are not sufficient. In this respect the country is awakening to the possibilities of automobiles, the government setting the pace in all branches.

Reputations Grow Rapidly

The nature of the present gradual development of the automobile in Russia dictates some interesting points which it is valuable to keep in mind when going after business with the view of establishing a permanent undertaking there. The majority of present automobile owners and those who are the possible prospects of the near future for pleasure or commercial vehicles, as a general rule, are so situated that they come in contact with each other very easily, which is assisted by the many clubs of which they might be members or visitors. Very many owners and even prospects are sufficiently interested in cars, etc., to belong to the different local branches of the Imperial Automobile Club. The number of machines being limited as yet, the reputation of each individual make travels rapidly between this class of people and their acquaintances interested in automobiling. A person well known in automobile circles in Russia stated to the writer in this connection that any accident or mishap to a car in the south of Russia is very soon known in St. Petersburg and vice versa, thus taking a share in the establishing of a good or unfavorable reputation for the particular car all over the country.

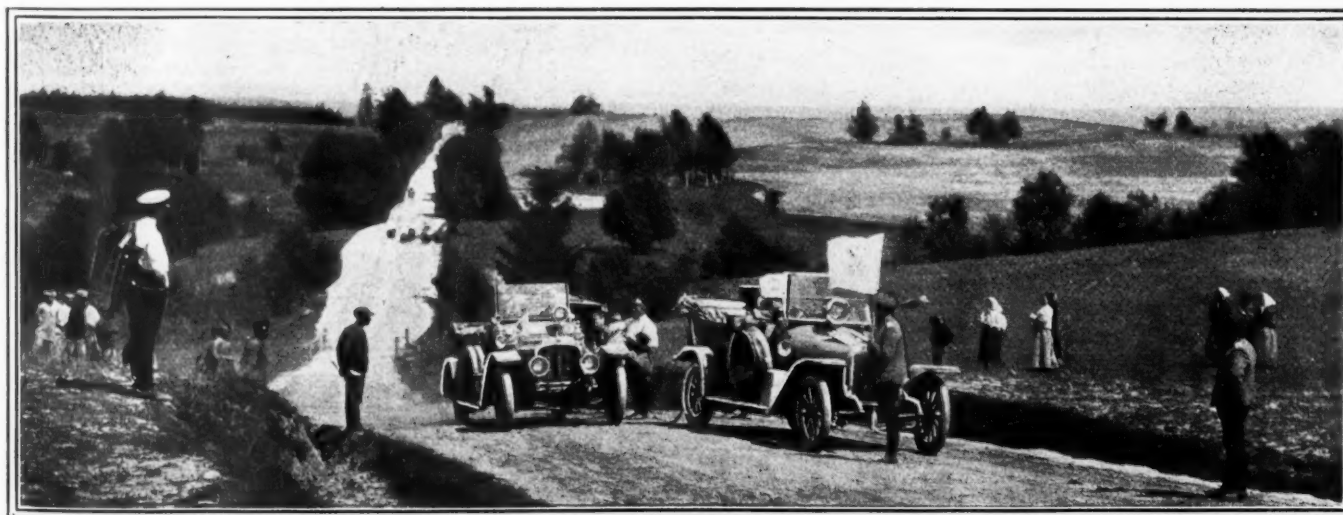
Some makes are firmly established in the Russian market. The efforts required for the introduction of a new make of car can be best realized by actually observing them. It is considered good policy to select one's customers, not selling the car at random to everybody who wants to buy it until the machine has made a good reputation for itself.

Much influence upon public opinion can be derived from contests, which are being held every so often under the management of the different clubs and other organizations. The advertising value gained in winning a contest is very great, but at the same time the character of the contest and the list of entries should be looked into before taking part in it. It is better to abstain from entering it than to come out a bad loser, particularly if one has a new make on his hands, in which case one must be sure about the winning chances for it. There are cars which originally had a good business in Russia but are gradually dropping out of line, simply because they have made an unfavorable showing in contests.

Advertising Brings Good Results

Advertising in daily papers and in the two Russian magazines devoted to the automobile business brings good results. But the style of advertisement there is entirely different from the American style. Generally one does not say much, merely giving a few brief but convincing facts about the car and its record. A long advertisement or one written in boastful form will most surely displease the readers, who are all inclined to be sceptical in regard to any statement which is not strictly proven by facts at the same time. The public may have very little technical knowledge, but it has a highly developed literary sense. A few well and reservedly written facts are bound to attract attention. Short explanations of some of the meritorious mechanical points, run as a series, should satisfy those who are more or less mechanically inclined and who like to know something about the parts of a car before buying it, to which class belong practically all those who are interested enough to be subscribers of the trade papers. The distribution of advertisements among the different territories is best done through a central office, so that agents of one territory would not feel as if they carry the burden of cost for the benefit of the other fellow. That might be the case because people in the provinces very often read newspapers published in Moscow and St. Petersburg and the advertisements of the dealers in these two cities help a lot to the dealers in the province, for instance in southern, western and other parts of Russia. The cost of advertisements is much lower than in the United States, a dealer of a popular-priced car in Moscow spending only about \$3,000 yearly for quite frequent publication in several daily papers there.

(To be continued)



One of the steep hills encountered on the Russian military endurance run. Note the rolling character of the country

Thinks the Light Car Solves the Economy Problem

Engineer Finds that Public Favors the Light Car Type for Maximum Service Combined with Low Maintenance Cost — Principles of Light Car Design

By William B. Stout
Chief Engineer Scripps-Booth Co.

A car twice as big costs four times as much to run.

A car half as big has one-fourth of the surface and weighs only one-eighth as much.

A car twice as big weighs eight times as much.

LIGHT weight is the basis of low car cost and upkeep. Light axle weight is the basis of car comfort. Total weight has very little to do with comfort and the lighter the car the more comfortable it can be made, for the smaller the weight of the car in proportion to the rider's weight the less it can affect him. The weight of a mere man has little effect on a 400-pound rear axle under stiff springs.

The Tread-Wheelbase Ratio

A light car can hold the road as well as a big car. A short wheelbase car can be as comfortable and easy to steer as a long wheelbase limousine. This depends not on the wheelbase but on the ratio of tread to wheelbase. Any narrow tread car can negotiate even the worst of road conditions and the narrower the tread the better chance it has to pick a good track. The idea that the smoothest part of the road is in the ruts is erroneous. The ruts, as a rule, contain the biggest bumps and "thank-ye-ma'ms," and in bad places the wise driver of the big car spends his time dodging ruts, not trying to stay in them.

Much that has been believed regarding big cars and tread has been upset by the light car movement and the public can take a new attitude of mind towards road vehicles as a result.

Horse Set Tread Standard

The first motor cars were built horse size. Horses were a certain height and to drive them the seats had to be a certain height. To accommodate the height the tread of the wagon or carriage had to be a certain width, and hence the road standard of 56 inches. This is a horse standard.

When motor cars were built the idea was to make horseless carriages and these were first built with this idea in mind. The seats were buggy-high and buggy-wide and the wheels were large, as in buggy practice. The vehicles were in truth horseless carriages and fit for horse speeds. As speeds were increased it was found that the weights were too high in the air, and the wheels too high, and lower constructions were gotten up with weights better distributed.

At first engineers saw the advantage of the light car and many were built up and put on the market. Crest, Blood Bros., La Vigne, Orient, etc., etc., and yet the public, not yet wise on motor engineering, wanted something the size of Mrs. Croesus' brougham and big enough so that one wouldn't

be looked down on. They refused to buy the light car. The motor buying public at that time was the rich man and the rich man's son and wife. These wanted, not a cheap light car, but a horseless carriage. To build a machine of this size took weight and power and road juggernauts were the result.

Since then the rich public has been supplied with cars. It has driven heavy cars and light cars and big cars and little cars; cars with two, four and six-cylinder motors; one-lungers, air-cooled cars and water cooled, friction driven and planetary, and the common people with them have come to know about the motor car and what each construction will do and will not do. They know the limitations of each construction, but only recently, since the moneyed buyer has been supplied with cars and the common people have begun to buy has the need for really light weight been insistent.

Light Car Economy

The people know that light weight means low upkeep and low first cost. They know that the particular light cars that have been sold in thousands as the only cars of this class are not ideal for everybody and they want a different car even at more money. Indeed, the great surprise of the light car movement has been that price was the smallest object; that is, the first price. The public wants a small car with dignity, refinement of line, luxurious finish, deep upholstery, high dust-proof sides, with the latest of everything in fitment and are willing to pay so the low upkeep be there. A car at \$300 looking cheap will not sell in such quantities as a \$600 car with the luxury and finish the public want.

A certain light car selling at about \$500 offered an electric starter at \$90 additional. Eighty per cent. of these cars are going out fitted with starters. The public wants the latest thing even in a light car and is willing to pay.

Every firm making light cars is having small difficulty with sales. The trouble is to make the cars fast enough. This is different from the cyclecar factories, nearly all of which have been disappointed in sales while surprised at road performance. The reason is not far to seek, when the simpler cyclecars are considered.

The public knows a water-cooled motor and is slow to be convinced of the V-type air-cooled even though it performs well. They know sliding gear and shaft drive, but are chary at first of belts and friction. They are willing to pay \$100 more, even for a car of standard construction, to be sure they made a good buy rather than to pay less for a faster, easier-riding car perhaps, but about whose construction they know little.

Cyclecar Lessons Taught

The cyclecar movement, however, taught two things: first that there was a real road advantage, instead of a disadvan-

tage, with a narrow tread; and second, that the light car could be as comfortable as a big car. They learned that the proportion of weights under and over the springs, not total weight, determined road comfort, that the proportion of tread to wheelbase determined the road performance of the car, not wheelbase alone.

The wonderful road work of some of the simple cyclecars with small motors was due to wheelbase tread proportions equivalent in some cases to 180-inch wheelbase on standard tread, and 80-pound axles under the springs instead of 400 pounds.

These discoveries are being made use of by several light car makers who are taking these ideas and fitting to them standard water-cooled motors, shaft drive and sliding gear-sets, making them motor cars in every particular but with extra light axles, bevel or worm, and narrow tread. These cars stay with anything on the road and are very luxurious in their riding quality, while the light weight makes them easy to handle. There is a future for light cars of any tread, for tread of standard road width is of far less importance than is imagined, while narrow tread has advantages from every standpoint.

In building light cars the idea is to build a small motor car, a reduction in size of a big car.

Surfaces have two dimensions, volumes three. When you make a part of half size it has one-fourth the surface area and one-eighth the weight or volume. To make a car the same way reduces the weight in proportion. To halve the weight of a car, however, is to show one-fourth the upkeep expense, so one can see that the light car is enormously cheaper to run than a big car irrespective of price.

The Weight-Trimming Process

The small car of today is not a reduced big car, though that is the aim. To bring down size but retain the same tread, through the reduction of wheelbase makes the cars heavier riding than their big brothers, and does not allow of the light weight necessary. To hold the strain and twist of standard tread the axle weight is almost the same as in larger cars and the light car that is built on standard tread is strong enough for a four-passenger body. This capacity body has about four times the sales field of the two-passenger, which is a city machine, so that it is probable that the standard tread light car of the future will be a four-passenger job.

Cut Wheelbase and Tread

If one would make a minimum-weight car, which is a minimum upkeep and comfort car, the tread may be reduced in the same proportion as the wheelbase and thus retain for the new car the same road comfort of the big car that it is copied from. Without this reduction in tread in proportion there is a tendency to spin when one front wheel strikes a bump, which absorbs power continually though hardly noticeable to the driver. The lines of the big car cannot be retained, the long sweeping body lines that give the dignity desired, unless the car width is kept in proportion. Hence the possible tendency on two-passenger jobs toward narrower treads than standard. These are obtaining beautiful lines and appearance and the road quality of the best cars. They are country travelers as well as city vehicles, and are especially fitted to touring work.

One reason for their touring fitness is the ease with which they may be handled, some of them steering like a bicycle and being set very low to the ground. This nearness to the ground gives the driver and passengers a sense of safety not to be found in cars with high seats and allows of a higher average road speed under the same road conditions.

The light car of the future may very possibly do 50 miles per day more in touring than the average big car, largely on account of the lack of fatigue on the part of the driver, and due to the higher average speed.

In building a light car the writer believes in certain principles as necessary for real performance, one of these being narrow tread, to give a tread-wheelbase proportion of sufficient ratio, and the other light axle weight, especially rear axle.

The reason for the narrow tread has been outlined and can be well understood. It is a thing which cannot be explained as to its road performance wonders, but which one can readily appreciate after a 5-minute ride. The feeling of the narrow low car is different and very pleasing, with an entire absence of the danger sense, hence allowing greater speeds. That narrow tread can meet any road condition has been proved too many times to require further argument, and for two-passenger work the writer believes the narrow tread car to be the motor vehicle of the future, if not the four passenger.

Make Axles Light

Light axle weight is vital. When you reduce the size of a car you must reduce the axle weight in proportion, and the advantage of narrow light constructions is that the rear axle weight can be kept under 100 pounds, including wheels and tires, even with a shaft drive.

The springs of a car introduce a time element into a shock, making it a pressure rather than a blow. The stiffer the springs the greater the pressure, and the more resilient the springs the more comfortable a car can be. A heavy axle, however, needs a stiff spring to control it and keep it down on the road, or when it flies into the air over a bump it will take too long in getting back to the ground again. In other words, its trajectory is not shortened sufficiently. It takes a stiff spring to control a 400-pound standard rear axle in a big car.

With a light axle of 100 pounds a 50-pound deflection spring can control the weight easily and the time element, when small bumps are hit, is very short. A light axle car does not notice small bumps at all, such as running over rough cobble or crushed stone roads. Bigger bumps give the effect of striking a feather bed, the shocks are so distributed.

Another problem of the light car is the differential action. If one were asked the weakest point of the modern car an engineer would probably say the differential. If this is so in big cars it is more true in small cars where the differential gears are very small and correspondingly delicate. With the light car the weight needs distribution to obtain traction, and by using some form of differential, such as the new gearless types, which drive from both wheels this traction can be had and cheap construction as well with a solid rear axle shaft.

Requires Very Long Springs

The springs of a light car should be as long as those in a big car, for the road bumps met are the same size, and the car should show ability over the same roads. The light car can set a new standard of road comfort if these ideas are followed.

All of this is getting away from the horse-size idea, and horse tread, and by carrying the weight low on the new cars of narrow tread great stability is obtained with very little side throw. The seats are as near to the ground as comfort allows, the floor as low as consistent, and one can step from the running boards into the car at the same floor level, perhaps.

The light car is coming. It will be available in cheap construction and in luxurious elegance; it can be had with the latest mechanisms and with older tried-out but less efficient constructions at a lower price. It will be welcomed by cities and traffic police as taking less street space and moving faster and surer. The dawn of the light car era is at hand.—WILLIAM B. STOUT, Chief Engineer, Scripps-Booth Co.

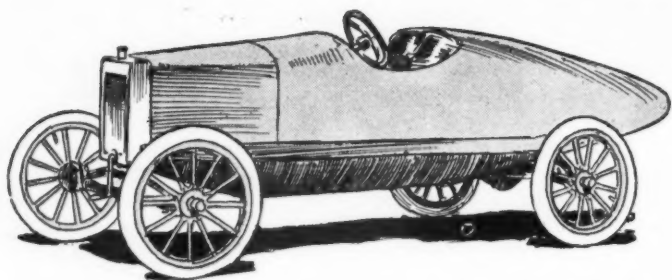


Fig. 1—Ford racer with streamline body and narrow aeroplane radiator

The Rostrum

How to Build a Ford Racer

EDITOR THE AUTOMOBILE:—I am planning to convert a new Ford chassis into a racing car. I want to make it as fast as possible and am willing to buy anything for it that will accomplish this end. It will not be used in races but on dirt country roads.

Macomb, Ill.

EVERETT A. REXROAT.

—Increased speed may be obtained by reducing the wind resistance, carefully balancing the motor, lightening the reciprocating parts, changing the valve timing, advancing the spark and reducing the gear ratio between the motor and the rear wheels.

It probably will not be necessary to do all the things enumerated in order to get the speed you desire, unless you want the absolute maximum.

By cutting down the wind resistance and carefully balancing the parts the speed should be considerably increased probably to 60 miles per hour, although we have no figures.

If more speed is wanted, lighten the reciprocating parts and reduce the gear ratio.

Changing the timing or increasing the lift of the valves is not advised because of its expense, and you should be able to get sufficient speed without it. Furthermore, the motor probably would not stand the strain for any length of time that the new valve timing would permit, and even if it would it is doubtful whether the car would hold the road, due to the stiffness of the springs.

Lowering the wind resistance is a simple matter, and most important because the resistance offered by the wind increases as the cube of the speed. That is, the loss at 60 miles per hour to that at 20 is not triple but in the ratio of

$$\left(\frac{60}{20}\right)^3 = 3^3 = 27 \text{ times.}$$

A full streamline body, Fig. 1, with sweeping curves from front to rear may be used. The cost of construction should be under \$200 if made by a body builder and less, of course, if you do the work yourself. If you have the body built, the exact cost will depend on whether any of the panels are spherically curved and require beating into shape. Where sheets of metal can be bent over the body framework without beating the cost is less. The latter type of body is the only one you could build yourself. The appearance of the car would be enhanced by employing a V-type Ford radiator or a narrow radiator such as is used on aeroplanes. As far as cooling is concerned the present radiator would be all right for short spurts but for continued running you would need to

increase the capacity of the cooling system either by the use of a pump, a larger or higher speed fan, a larger radiator, or all three. The gasoline, oil and tires should be carried in the rear.

It would be simpler but almost as effective to fit two bucket seats to the floor of the chassis, and place the gasoline and oil tanks, and tires in the rear. Such a car is shown in Fig. 3.

It will be noted that the angle of inclination of the steering gear has been increased, in order that the driver can reach the wheel. This is done by forging a new steering gear bracket.

Bucket seats can be obtained at a cost of about \$25 each from any body builder, and gasoline and oil tanks can be ordered through your supply dealer.

The fenders should be left off altogether, or else simple canvas ones fitted as shown.

Remove the pistons and connecting-rods and weigh the four rods and the four pistons. Then take off enough material from the heavier ones to bring them to the exact weight of the lightest.

If you want to lighten the pistons, drill below the wrist-pin. One-quarter-inch holes at a distance of one-half to three-quarters of an inch should be satisfactory. It is best to remove this material before the pistons are balanced.

Piston clearance should be increased except at the lower end. Make the top of the piston .005 of an inch smaller than the cylinder and taper off until the lower end is reached where the size remains the same.

The valve timing may be changed either by advancing the camshaft, or using a new camshaft with special cams that give increased lift and a longer opening, the latter is expensive however, because it costs money to make a camshaft. As already stated it is doubtful whether the motor would long stand the strain due to the increased speed that the motor would be capable of if this were done.

Advance the camshaft one tooth and note the result, then advance it another tooth and if the running of the motor is improved it may be found advisable to set it forward still another.

New Camshaft May Be Needed

If a new camshaft is made, the valves should open and close as follows: Intake opens, 20 degrees after upper dead center; and closes 50 degrees after lower dead center; exhaust opens 60 degrees before lower dead center and closes 15 degrees after upper dead center. It would also be advisable to increase the steepness of the cams to give a quicker opening and closing. Heavier valve springs will need to be fitted to hold the pushrods to the cams at high speed. The lift might also be increased to 5-16 or 3-8 inch.

The next size larger carbureter and a larger manifold might also be installed.

Sufficient lubrication is very important, and an auxiliary tank should be fitted so that oil may be injected directly into the crankcase, when running fast. Such a tank might be attached to the left side of the motor, allowing the oil to be fed by gravity through a pipe running into the crankcase, the rate of discharge being regulated by a plug cock that is controlled from the dash. Or you might place the oil tank in the rear of the car and feed by means of air pressure produced by a hand pump lying within easy reach of both driver and mechanic, when one is carried.

The gear ratio may be changed to about 3 to 1, although with the reciprocating parts of the motor perfectly balanced and lightened the car should do between 55 and 60 miles per hour anyway. The new gears will have to be made by some machinist, as the Ford company does not make any gears other than the standard ones which give a ratio of 3 7-11 to 1.

With the lighter body, the stiffness of the rear springs should be reduced. Try the car both with one and two leaves removed.

It must be remembered, however, that in increasing the speed of your car you are shortening its life. Furthermore, it will not run slowly on high gear if the suggested changes are made in the motor.

Formula for Long-Stroke Motors

Editor THE AUTOMOBILE:—Will you please give me the formula for figuring the horsepower of the long stroke motor for both four and six-cylinder motors?

Clinton, N. C.

F. RAWLA.

—You might use the formula,

$$\text{h.p.} = \frac{D^2 N S R}{15,000}$$

where

D = bore in inches.

S = stroke in inches.

N = number of cylinders.

R = number of revolutions per minute.

This is not official; there is no formula that has been generally adopted that takes the stroke into consideration such as the S. A. E. formula which is based entirely on the bore and number of cylinders.

Effect of Tire Diameter on Differential

Editor THE AUTOMOBILE:—Recently I purchased a clincher tire stamped 32 by 4 inches. It measures 31 1-2 in. in diameter, and the cross-section is correspondingly skimpy. Would you advise using it on the rear with another tire, of different make, full 32? What effect will it have on the differential? The front tires are of different size, so it cannot be used there.

Milford, Conn.

J. H. NETTLETON.

—This slight difference in tire size will not cause an appreciable amount of wear in the differential. Since it is only 1-2 inch in 32, the ratio is 1 to 64 and the percentage is 1.56. In other words the smaller tire will make 1.56 more revolutions in 100 than the larger one.

Speedometer Gear Makes Noise

Editor THE AUTOMOBILE:—1—There is a swishing sound issuing from the neighborhood of the right front wheel of my car when it is in motion. It seems to occur once every revolution. What do you think can be causing it?

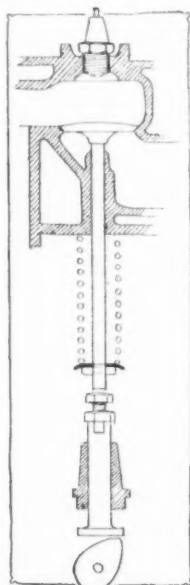


Fig. 2—Valve mechanism of typical motor

2—A short time ago I found that I could turn the front wheels of my car when it was standing on the garage floor by merely pulling on the tires, yet I thought that my steering gear was irreversible. What is the explanation?

Mt. Vernon, N. Y.

E. W.

—1—There are two very likely causes of such a noise. It may be due to the speedometer gears meshing too tightly, or the demountable rim has a wedge loose. Jack up the wheel and rotate it slowly, and you can soon determine whether the gears are too close. If this is the case, loosen up the arm that carries the driven gear, and move the gear only far enough away so that the noise is eliminated. If the trouble is not found in the speedometer gears, tighten up the wedges on the rim. One loose wedge will make a noise similar to that you have described due to the lack of support at this point.

2—No steering gears are absolutely irreversible. One that would not give way when struck would soon break. It takes more force, however, to deflect the wheels with this type than an irreversible.

Valve Operation of Motor

Editor THE AUTOMOBILE:—1—Please publish a cut showing the valve system and all points of adjustment on the 1913 Regal underslung motor.

2—Also please inform me as to where I can obtain a transmission gear for a 1910 E. M. F.

Vineland, N. J.

R. W. CALL.

—1—The complete valve mechanism is illustrated in Fig.

2—It consists of a cam, valve tappet, and valve together with its spring.

The valve opening is accomplished by the rotation of the cam which is part of the camshaft, which is driven by a

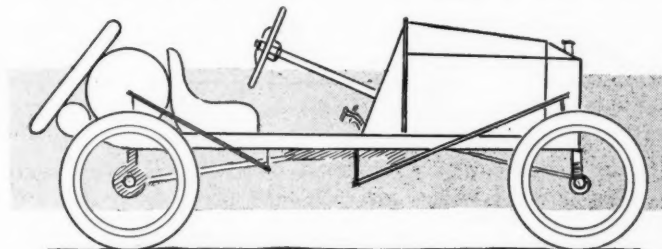


Fig. 3—Ford raceabout with pointed radiator

pair of gears from the crankshaft of the motor. This cam comes into contact with the mushroom face on the lower end of the tappet and the tappet is forced upward, its movement pushing the valve with it, and thus opening the port and allowing the gases to flow out. As the cam moves out of contact with the valve tappet, the spring on the valve forces the valve closed. When the valve is fully closed there is a slight amount of clearance between the valve stem and the top of the tappet and also between the lower end of the tappet and the circular surface of the cam.

The former space should be about the thickness of a piece of writing paper and as it is liable to change with wear, the tappet is adjustable. The upper end of the tappet has a hexagonal head, and screws into the lower half which is milled flat on two sides to provide a place for gripping with a wrench.

In addition there is a lock nut that holds the two parts securely in place. The adjustment is accomplished by loosening the locknut by turning it to the right, meanwhile the lower part of the tappet is held against rotation. Then the upper part of the tappet is turned while the lower part is held stationary, until the gap is the proper distance. Then the locknut is turned to the left again until tight.

The valve is removed by taking out the valve intake plug and then raising the valve spring seat by means of a tool that is made just for this purpose, then the key holding the spring seat in place is pulled out and the valve removed for grinding or inspection. In case it is desired to take the spring out this may be done with the fingers. The valve tappet and guide may be removed by unbolting the guide.

Standard Speedometer Shaft Revolves 1,680

Editor THE AUTOMOBILE:—Will you kindly tell me how many revolutions the link chain in a Standard speedometer makes during a steady run of 1 mile?

Indianapolis, Ind.

I. P. ZIMMERMAN.

—The shaft of the Standard speedometer revolves 1,680 revolutions per mile, regardless of the diameter of the car wheels. This particular figure was selected because it gives a very simple method of figuring the number of teeth in the

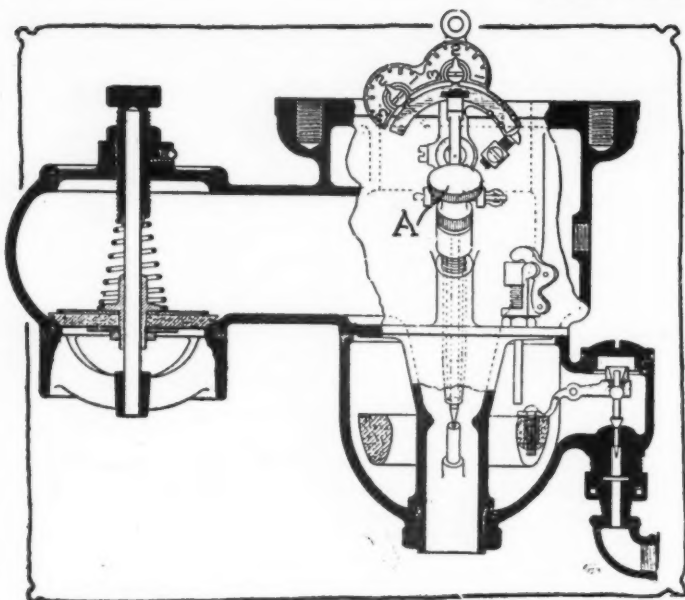


Fig. 4—Schebler model L carburetor

driving sprocket for a tire of a given size, namely, one tooth in the driving sprocket for each inch of tire diameter. A 12-inch wheel will revolve 1,680 times in traveling 1 mile. Therefore, if this wheel were attached to a 12-tooth driving sprocket which in turn drove a 12-tooth gear which was attached to the speedometer shaft, the ratio between the gears would be 1 to 1 and the speedometer shaft would make 1,680 revolutions per minute. If a 24-inch tire were used the wheel would make half as many revolutions per mile or 840. By using 24 teeth in the driving sprocket to drive 12 in the driven one the reduction is 2 to 1, and the speedometer shaft revolves 1,680 revolutions per mile just the same. With a 36-inch tire, 36 teeth would be used and this would give a ratio of 3 to 1, etc.

Cylinder Should Not Leak

Editor THE AUTOMOBILE:—Will you please tell me whether a cylinder should leak compression past the rings when stopped on dead center? If it should not leak, how do you remedy this?

2—Are the patented rings practical?

Westmount, Mont.

W. H. HASKELL.

—1—The rings should be tight enough so that no appreciable loss of pressure will occur for, say, a minute, but it cannot be expected that the pressure will stay there indefinitely when the piston is stopped on dead center. From the way your question is worded it seems that you have turned the motor over until one of the pistons has reached the end of the compression stroke and that you left it there for a few moments, at least. If, however, we have misunderstood you, and the fact actually is that when you turn the motor over slowly without stopping, that the pressure decreases, then you have a leak. It may not be the fault of the rings, however, but due to the valves.

If the trouble is due to leaking rings they must be replaced and if the pistons and cylinders are very badly worn it may be necessary to bore out the cylinders and fit larger rings.

Before going to the trouble of tearing down the motor and examining the pistons and rings, remove the exhaust valve and note whether it is carbonized, or pitted. If so it must be ground. Also note whether there is any clearance between the valve stem and the push rod. (See Fig. 2.)

There should be sufficient space to insert a piece of writing paper, and if there is not the push rod must be adjusted by loosening the lock nut, which is the lower one and then turning the upper nut to the right. If there is no clearance

the valve will be held off its seat and leakage will occur. If the exhaust valve is found to be in good condition, examine the inlet valve. It is not likely that it will need grinding although the push rod may be out of adjustment.

2—Some of the patented rings are satisfactory but whether they all are we cannot say with certainty because we have not seen them all in use.

Economy Record Is 86.6 Miles

Editor THE AUTOMOBILE:—Kindly advise me what carburetor holds the world's economy record on an automobile, and what is the number of miles?

Plainfield, N. J.

PLAINFIELD AUTO TIRE CO.

—A Newcomb carburetor on a Franklin car undoubtedly holds the record for economy, the car having traveled 86.6 miles on 1 gallon of gasoline over Long Island roads, on June 21, 1913.

The car had a four-cylinder motor with a bore and stroke of 4 by 4 inches and without passengers weighed 1,690 pounds and with two passengers, 1,995 pounds.

Everything was done to reduce the coasting resistance of the car used in this trial for the record. Ball bearings were placed on the rear axle, a Newcomb carburetor fitted, the spring cut down so that there were but four blades in each half of the elliptic front and rear springs, the drive was taken through the springs and through one rear wheel, the other running free. One set of brakes, controlled by the hand, was used, 34 by 3.5-inch plain clincher tires pumped to a pressure of 35 pounds were fitted. The brake drums were even perforated to bring the weight to its absolute minimum. Wind resistance was cut down by using the streamline torpedo body, which carried a tapering cowl to cut the resistance.

Gasoline 63 Baumé

The gasoline used was 63 Baumé test carried in a measured copper receptacle on the dash before the observer's seat. This was fed by gravity to the Newcomb carburetor which was standard except that the easy-starting, air shut-off valve was omitted. The odometer used was a Casgrain.

The course followed was on the Queens boulevard. The car traveled from the Williamsburg bridge out Queens boulevard to Hillside avenue, Jamaica, swinging left to the Jericho turnpike which was followed to the hamlet of Jericho where a turn was made across the island and then back over the same roads to the starting point. On the return to the starting point it was found that a little better than 60 miles had been covered and that some gasoline still remained. The remaining 20 miles was covered by a trip out Jackson avenue, and back and then another out the same route and nearly back to the starting point, so that the car went up practically every grade that it went down, although at times it seemed as if the car was fairly coasting up grade, so easily did it run.

Speed 14.5 Miles per Hour

Country passed through on the Franklin test was fairly level with an occasional 2 or 3 per cent. grade. The test lasted six hours, which makes an average speed over the entire distance of 14.5 miles per hour or regular touring speed. The driver would open his throttle until he had attained a speed of close to 20 miles an hour and then would stop the motor and coast.

It has always been a fascination to determine what mileage can be secured from a gallon of gasoline. A motorcycle has traveled 190 miles on 1 gallon and 10 ounces. This was done by S. A. Baker, September 13, 1907. The average accomplishments, however, of stock models with regular bodies fall far below these record tests. The average gasoline automobile travels from 15 to 20 miles on a gallon, although some touring

cars go as low as 4 miles to the gallon and others as much as 28. The average steam automobile goes 10 miles to the gallon. The average aeroplane 10 miles to the gallon, but with its fuel mixed with lubricating oil. The average motorboat of corresponding horsepower to an automobile goes about 12 miles to the gallon, while a single-cylinder motorcycle will average better than 75. The strength of gasoline may be fully appreciated from the fact that it has been stated that could the entire energy contained in 1 pound be utilized it would lift a 1-pound weight 15,941,220 feet.

Rich Mixture Causes Leakage

Editor THE AUTOMOBILE:—Will you please tell me how to remedy the Schebler carbureter L on a 1913 Buick. When cranking, the gasoline flows out the air opening next to the pipe that carries the gasoline into the carbureter. At every crank the gasoline sputters out. It will not fire in the engine until all of the gasoline has sputtered out. All joints are tight. The float has been dried and shellacked. I can find no leak.

Madison, Ga.

A. K. B.

—The needle valve, which controls the low-speed adjustment is open too far, allowing the fuel to flow out too freely. Screwing down on this valve should remedy the trouble. This valve is shown at A, Fig. 4, and should be turned down until the motor idles perfectly.

Formula of Calculating Water Capacity

Editor THE AUTOMOBILE:—Kindly publish a formula for figuring the amount of water needed to cool a gasoline motor.

2—Also a formula showing how to figure what size pipes are needed on a thermo-syphon motor.

St. Louis, Mo.

V. C. KLOPPER.

—1—The only data we know of on this subject is that represented in the curves shown in Fig. 5. With the piston displacement per minute known, the pounds of water required per minute and the B. T. U. lost to the cooling water for any given range in cooling water temperature can be figured.

For example let us assume that the displacement per minute is 1,000 cubic feet and that the difference between the temperature of the incoming and outgoing water is 50 degrees. Reading vertically from 1,000 cubic feet per minute piston displacement, to the B. T. U. curve, proceed horizontally to the left until the diagonal representing 50 degrees range is reached. The vertical line through this point represents a flow of about 115 pounds of water per minute and the heat loss to the cooling water is shown by the horizontal line which indicates that the loss is about 6,400 B. T. U.

2—No formula, as far as we know, has ever been published giving the size of pipe needed. In fact, it is difficult to see how a formula, that would give any more than a general idea, could be constructed unless, all types of motors, equipped with all shapes of pipes, types and sizes of radiators, and fans were tested out and constants for a general formula thus determined. It is seen that the factors that may be varied are so numerous that there are innumerable combinations, each one of which will give a different result and require a different size of pipe.

If you are designing a motor and want to know what size pipes to use, it would be best to find out the dimensions of the pipes on the successful motor that it resembles most, and make your pipes the same size. If it is found, after the motor is built, that the pipes are too small use a larger fan or increase its speed, or fit a larger radiator.

Car Jerks; Motor Fires Well

Editor THE AUTOMOBILE:—I have a 1912 second-hand Buick roadster which has a jerk which local mechanics have failed to locate or remedy. I have recently ground the

valves; have put new platinum points in the magneto and the motor is firing perfectly, but there is a jerk, usually regular, which resembles the actions of a car when one cylinder is completely misfiring. The rear axle is slightly sprung and this might cause some of the jerking, but many times I can throttle the car down with cut-out open and it will run along smoothly for a block or so and then will start to jerking. There is some play in the universal joint and differential, but no play in the rear wheels themselves. The peculiar part of it is that when the car is jerking, the motor is firing perfectly.

Warren, O.

P. D. TAYLOR.

—Excess play in the universals would be enough to cause the jerking, but assuming that this is not the cause you may look to the clutch, which may be gripping only at intervals. Do not throttle the motor down too low and expect it to pull smoothly. The usual cause of such action is play somewhere between the rear axle and the motor and if you will remove this play the jerking no doubt will vanish. It would be wise to take the car to the nearest Buick agent and have him look it over.

Crank With Throttle Nearly Closed

Editor THE AUTOMOBILE:—What, in your opinion, is the best way to crank a motor, with the throttle open or nearly closed?

Albany, N. Y.

E. A. STOKES.

—It is preferable to crank the motor with the throttle only opened a small amount, say an inch or an inch and a quarter movement on the quadrant. With some carbureters it is impossible to start the motor with the throttle wide open, while with the others it is generally done with difficulty.

Please Sign Your Letters

Communications to the Rostrum should be signed in full and the writer's address also stated. A great many letters are forced into the waste basket because of lack of proper identification.

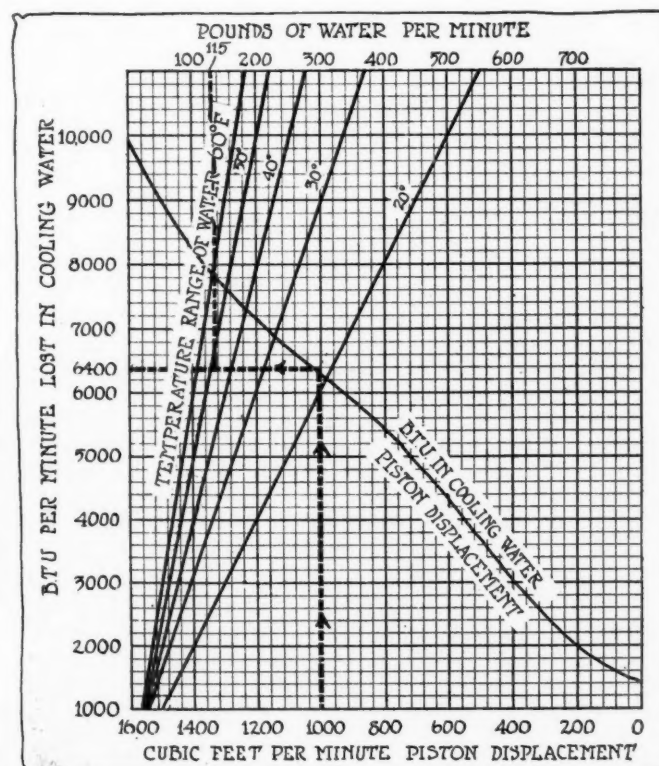
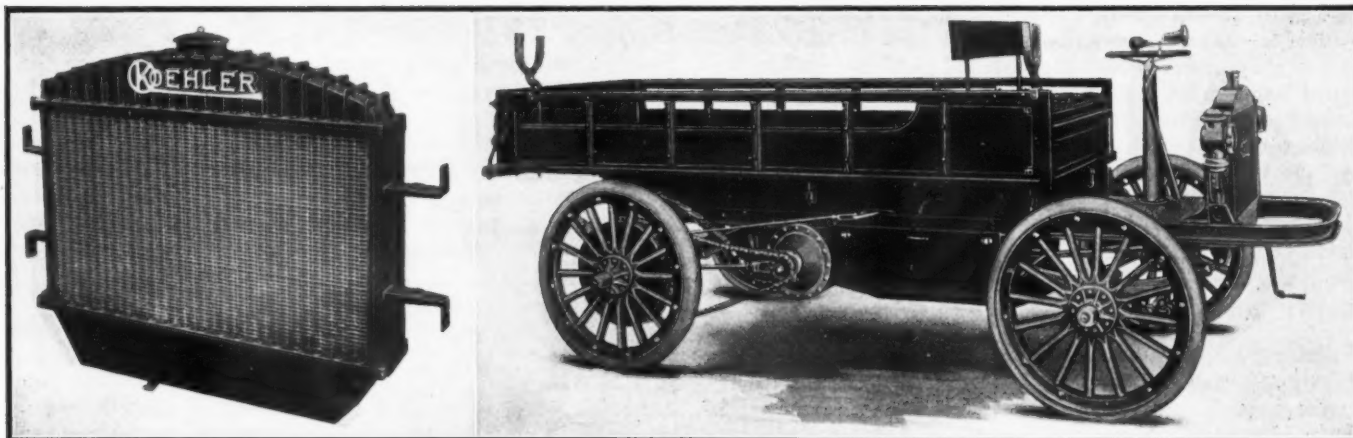


Fig 5—Curve showing pounds of water per minute and B. T. U. per minute lost in cooling water for a given piston displacement



Left—New Koehler radiator with a cooling area of over 1,450 square inches. Right—Koehler 1-ton truck with open type of body

Koehler Has Improved Radiator and Gearset

Two-Speed Planetary System

Housed with Jackshaft—Under-Body

Included in Chassis Price of \$725

ONE of the important low-priced commercial car announcements for 1915 comes from the H. J. Koehler S. G. Co., New York, which markets a 1-ton chassis selling at \$725, including the under-body. The new Koehler, although in essentials the same as the previous model, has been improved where necessary and the most important parts to receive attention are the radiator and gearset.

The new radiator, which is hung between springs, has a cooling area of over 1,450 square inches, it is claimed, and is built up of five separate units. These are the upper head, lower head, the core and two side pieces, to which the lamp brackets are attached. Ninety-nine tubes are used in the present construction and the entire radiator improved upon so as to make it better able to withstand severe strains. An important feature of the Koehler radiator is the ease with which it may be removed and replaced. In the event a part be broken only that part need be replaced.

Gearset Part of Jackshaft Unit

A novel feature of Koehler construction is the two-speed planetary gearset which is contained in a cylindrical housing containing the jackshaft, as shown in the illustration herewith. The jackshaft itself is of one piece from the left-hand sprocket to the differential, which is at the end of the planetary set and may be seen in the illustration. The jackshaft transmission and differential run in oil and thus the wear is reduced considerably, while an added feature is the ease with which the planetary set in this unit may be removed for inspection purposes.

By taking off the end of the housing nearest the set the entire unit may be slipped out of the housing. The high-speed clutch of the set has a metal-to-metal contact and the low and reverse speeds are individual bands lined with wire-woven asbestos. It is stated that the operating speed of this gearset is one-half that of the ordinary construction, thus making for long life of the parts. The driving pinion shown has thirteen teeth and the large

driven gear has twenty-five. All gears are fully protected from dust.

A two-cylinder motor is installed under the body of the Koehler, the dimensions of this engine being 5.25 by 4 inches. The carburetor used is a Schebler and the magneto a Bosch with fixed spark. As before stated, it drives a planetary set incorporated in the jackshaft and the power then is transmitted by chain to the rear wheels. These are equipped with 36 by 2 1-2-inch solid, demountable tires. The wheelbase is 90 inches.

Sediment Strainer Added

Another slight change in Koehler construction has been the addition of a sediment strainer beneath the gasoline tank and the installation of a combination outlet valve which allows a 2-gallon emergency supply feature.

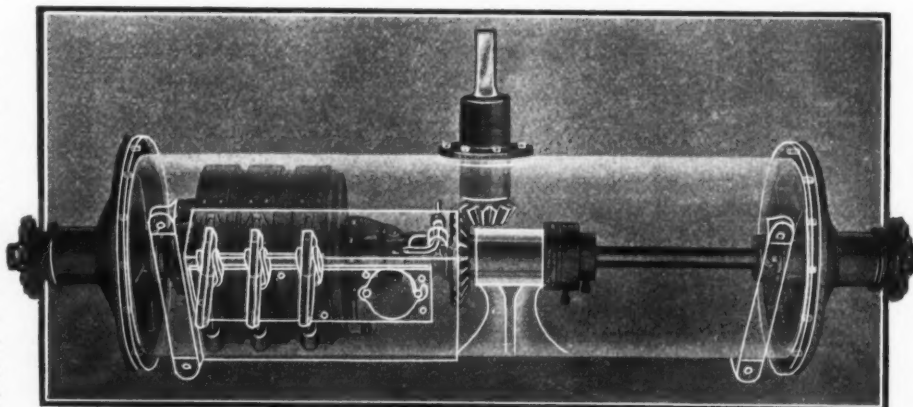
The express-type car forms the largest part of Koehler production, while a number of types have been brought out which are particularly adapted to some special business.

Technical Service of A. C. A. To Be Broadened

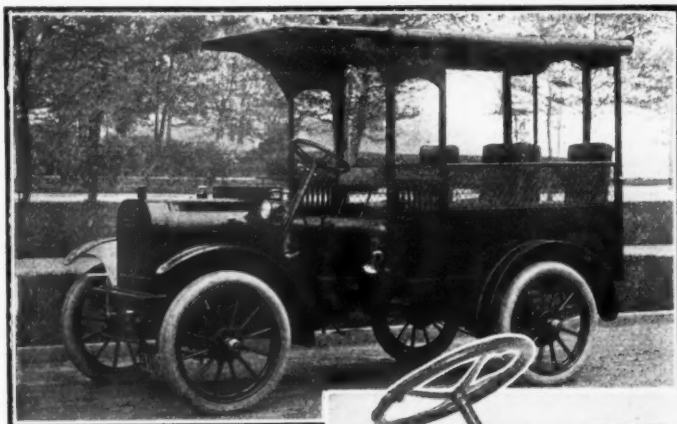
NEW YORK CITY, Aug. 15—It has been decided to place the efficiency bureau of the Automobile Club of America under the direction of the technical committee and to extend its activities.

It is the idea to make frequent, perhaps weekly, examinations of members' cars registered in the bureau, a monthly report with recommendations to be sent to the owners. Any repair or adjustment that is urgent will be the subject of an immediate notification to members.

By proving wasteful operation to members and that unsatisfactory delays and discomforts are due to neglect of cars, the bureau hopes to increase the general efficiency of the automobile.



Phantom view, showing two-speed planetary gearset contained in a housing with the jackshaft



Six-passenger wagonette,
\$695

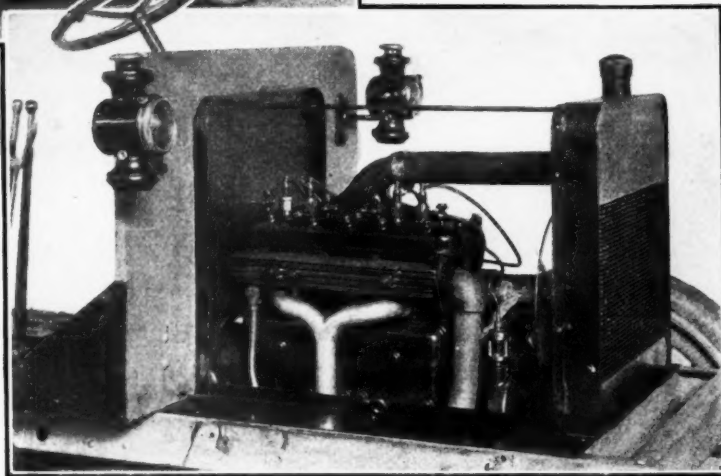
SIX hundred and thirty-five dollars is the astonishingly low price of the Vim light delivery wagon manufactured by the Touraine Co., Philadelphia, Pa. Yet the car is manufactured of standard parts throughout. It has a four-cylinder Northaway truck motor rated at 20 horsepower, a clutch and gearset in unit with the motor, made by the same concern, these members being capable of transmitting 35 horsepower, and a Weston-Mott rear axle designed for 30 horsepower.

Three other types of bodies mounted on the same chassis are offered, these being the large delivery body for \$685, the flare body for \$695 and the Wagonette, a 6-passenger bus, for \$695. Thus it is seen that a large factor of safety is allowed.

The chassis, with any type of body, has a capacity of 800 pounds, weighs but 1,850, and may be turned in a 36-foot circle, which is made possible by the 89-inch wheelbase. The loading space is 56 inches long and 42 inches wide, only 10 inches overhanging the rear. The floor is low, only 24 inches from the ground, being carried directly by the frame members. The motor is an L-head block construction with integral exhaust manifold and separate Y intake. The bore is 3 inches and the stroke 4.5 inches, giving an S. A. E. rating of 14.4. The valves are inclosed by two removable

\$635 Vim Delivery Has Standard Parts

Four Types of Bodies—
Unit Power Plant Design—
Block Motor of 20 Horsepower



View of motor showing disposition of piping

coverplates. The crankshaft bearings are 2 inches in diameter and three main bearings are employed. Cooling is maintained by a honeycomb radiator, the circulation of the water being on the thermo-syphon principle and assisted by a belt-driven fan. Lubrication is effected by a combination force-feed and splash system with a capacity of 2 gallons, sufficient for 600 miles. Ignition is supplied by an Atwater Kent system.

The clutch is a leather-faced cone type 12 inches in diameter and with a 2.5-inch face. The gearset is a selective sliding design, with gears of 3-4-inch face. The shafts are all of chrome nickel alloy, on imported annular bearings.

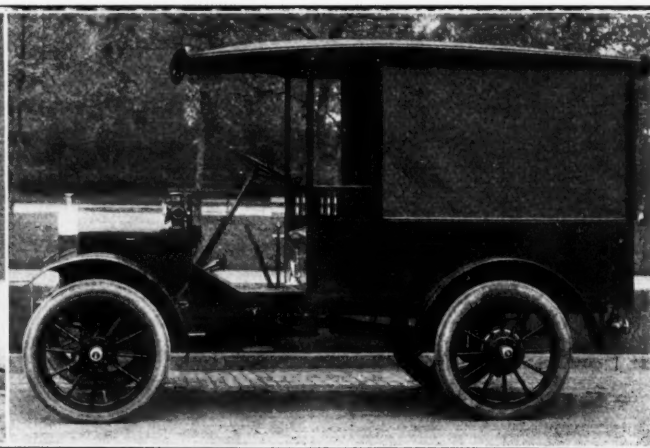
The front axle is a special drop-forged, I-beam section, the knuckles and steering arms being drop-forged and heat-treated. The rear axle, as already stated, is a Weston-Mott construction and is equipped with a Brown-Lipe differential. The drive shafts are 1 1/8 inches in diameter. The universals are of Hartford make.

Two sets of brakes, both acting on the rear wheels, are used, the contracting brakes for service and the expanding for emergency use. The drums are 10 inches in diameter and 2.5 inches wide.

Left drive with right control is employed. The maximum speed is 30 miles per hour. The tires are 30 by 3 inches, although 31 by 3.5-inch tires are optional at an increase of \$20.



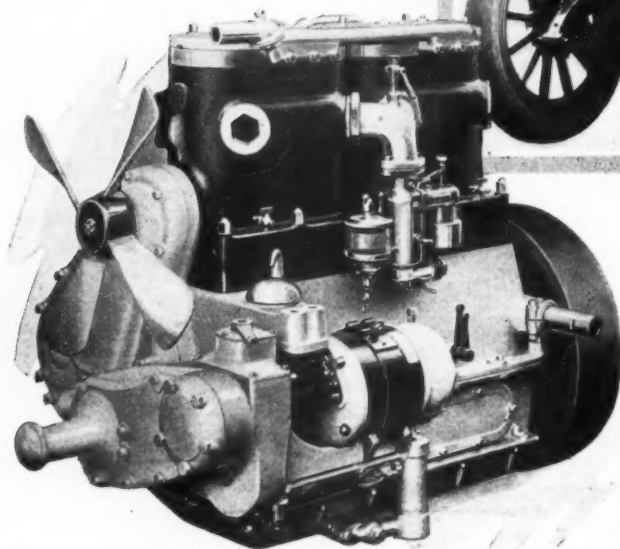
Vim chassis with flare body



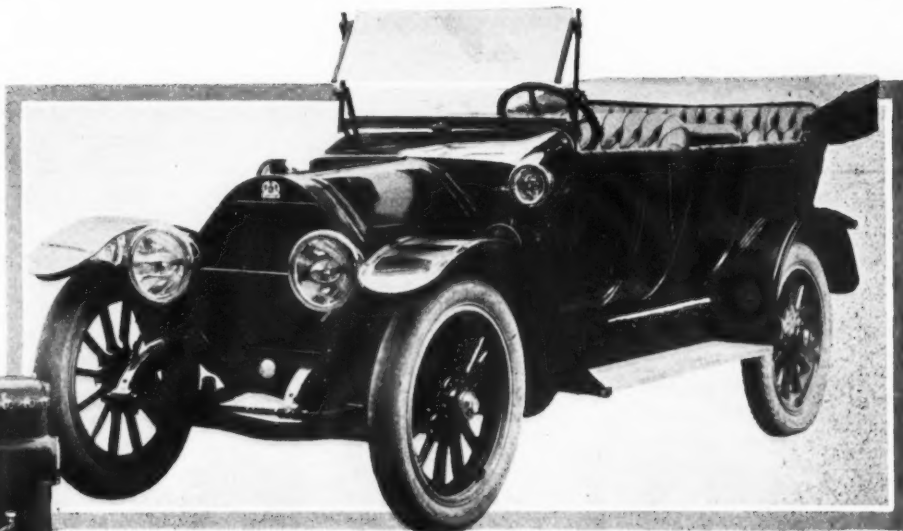
Vim delivery wagon

Lyons-Knight Has Streamline Body

Few Mechanical
Changes of Importance
—All Instruments
Now On
Cowl Board



Side view of motor used in Lyons-Knight cars



Lyons-Knight touring car of foreign lines

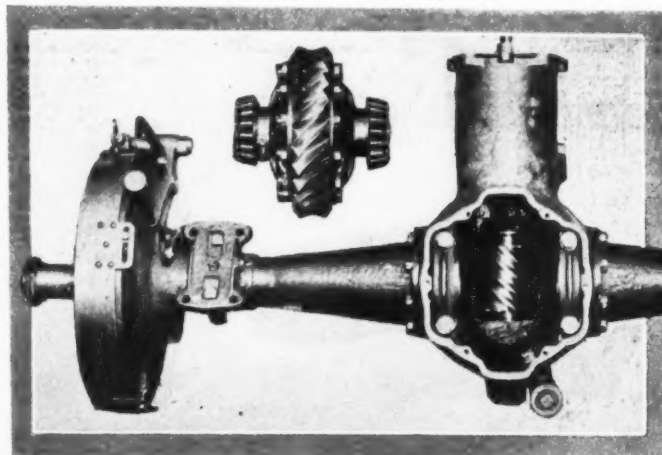
MAINTEINING the same prices and practically the same chassis as last year, the model K Lyons-Knight for 1915 is marked by many innovations in body construction. For the coming seasons the Lyons-Atlas Co., Indianapolis, Ind., offers a choice of four bodies on a single chassis model. The prices are, for the seven-passenger touring car, \$2,980; the five-passenger, \$2,900; five-passenger sedan, \$3,900, and seven-passenger limousine, \$4,300. In addition to this body line the purchaser has a choice of two-passenger roadsters which will be built to special order.

The Lyons-Knight chassis upon which these bodies are mounted has a Knight power plant and a worm drive rear axle. The chassis has a wheelbase of 130 inches and is equipped with 37 by 5-inch tires, the rear ones with non-skid tread. All these features distinguish the previous line of Lyons-Knight cars and it is only in the development of the streamline design that the most radical changes are apparent. The upholstery is now carried along the tops of the doors, giving a straight-line effect from front to rear, and the sides are now higher with wider front and rear seats. The rear seat is unusually wide, measuring 52 inches from side to side.

Instruments on Dash

All instruments such as speedometer, clock, gasoline gauge, oil pressure gauge, ignition and lighting switch and so on now are mounted flush with the instrument board. A convenient feature of the lighting control is a switch which

may be locked in any combination of lights. Equipment is somewhat more complete than formerly and consists of a Golde one-man top, option of Jiffy or Collins curtains, Warner speedometer, a combination double tire holder and trunk rack, two extra demountable rims and a Manzel power tire-pump. Mechanically, there is no change in the car. The Knight engine, which is manufactured by the Lyons-Atlas company, is a four-cylinder, 4 1-2 by 5 1-2, and, although the S. A. E. rating is but 33 4, factory test has shown that it develops 52 horsepower at 1,200 r.p.m., and a maximum of 76 at 2,000. The cylinders are cast in pairs and the crankcase, chaincase and cylinder head covers are cast of aluminum. The feature of covering the cylinder heads to keep out dirt and moisture and to protect the spark plugs is exclusive with the Lyons-Knight engine. Hard-rubber buttons are mounted on the covers by which the spark plugs can be short-circuited and tested without removing the covers. Crank and eccentric shafts are carried on five bearings and fitted with adjustable bronze bushings, babbitt lined. These two shafts, as well as the connecting-rods, are heat-treated chrome-nickel steel. The eccentric shaft together with magneto pump, starter and fan are driven by silent chain in order to do away with possibility of noise from the timing drive, a feature most necessary with the sleeve valve type of engine on account of



Worm drive rear axle continued this season

the quietness of the valve operation.

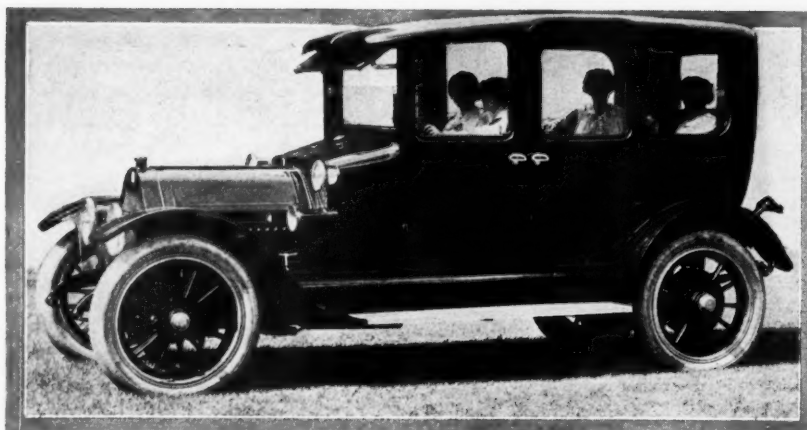
Lubrication is by force feed to all bearings, pistons and sleeve. An oil reservoir is located in a sub-base of the crankcase, having an intermediate air space to prevent overheating of the oil. A plunger pump operated by one of the sleeve eccentric rods takes the oil from the reservoir and forces it under pressure to the crankshaft and eccentric shaft bearings, the eccentric rod bearing and thence through holes drilled through the center of the crankshaft to the connecting-rods. The latter are hollow and the oil is forced through their interior to the upper bearing. The piston pins likewise are hollow, and the oil flows to these to the outside of the piston, thence through holes in the sleeves to the cylinder walls, so that all friction surfaces are lubricated by a positive flow. An adjustable oil pressure regulator is connected with the throttle lever so that the pressure of the oil is in proportion to the engine speed.

Ignition is furnished by a Simms dual, high-tension magneto of the water-proof type. Cooling is by a centrifugal pump, honeycomb radiator and a four-blade cast aluminum fan, which is operated by a silent type of chain. Following the European custom, the fuel tank is mounted in the dash cowl, giving a gravity feed to the specially designed Stromberg carbureter.

Single Electrical Unit

Cranking and lighting is provided by a single unit Northeast system which is connected directly to the front end of the crankshaft to a silent chain. A simple foot button connects the starter, and when released converts the motor into a generator for charging the storage battery, the latter furnishing current for the starter, the lighting equipment and the electric horn.

From the motor power is transmitted through a three-plate dry disk clutch, three-speed selective gearset, worm final reduction and floating axle. The clutch is inclosed in the flywheel, the single central floating member engaging by being gradually compressed between the two outside plates through the action of three powerful toggle joints. A special bronze casting is used for housing the gearset differential and worm gear, which are in unit and to which is attached the seamless steel tubing on which the wheels are mounted. Differential case and wheels are fitted with Timken bearings. The 3-inch torsion tube incloses the drive-shaft and terminates in a large, hollow, bronze, ball and socket joint at the forward end and is attached to the



Inclosed sedan body on Lyons chassis

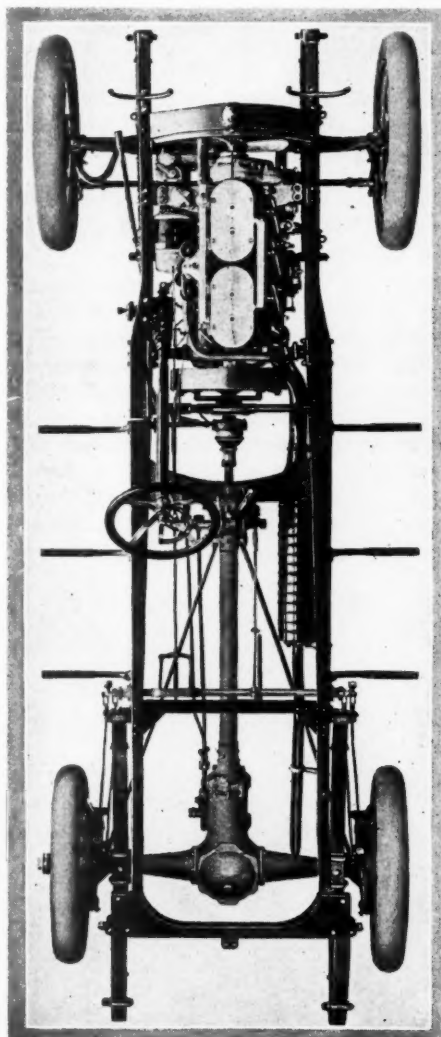
front, 38 by 2 1-2 inches, all ends being provided with bronze additions to give easy replacement in case of wear. The front springs are very quiet, being arranged so that they hold the front axle parallel with the rear axle, and prevent wobbling of the front wheels on rough roads. All models are equipped regularly with wood wheels which carry demountable rims, accommodating either straight-side or clincher tires. Expanding and contracting brakes act on 16 by 2 1-2 drums. Wire wheels may be obtained at an additional cost; not being specified.

Easy riding qualities are made a particular point in this car, the design being made with an eye to equal distribution of the weight and correct spring suspension.

Norway's Duty 12 Per Cent.

CHRISTIANIA, NORWAY, Aug. 10—Automobiles shipped to Norway completely set up or assembled are subject to an import duty of 12 per cent. ad valorem; if shipped separately, bodies to a duty of 15 per cent.; motors to a duty of 10 per cent. ad valorem; automobile wheels pay \$0.61 per 100 pounds; other parts, such as steel are dutiable \$1.82 per 100 pounds; brass or copper, \$6.08 per 100 pounds; nickel parts, \$12.15 per 100 pounds; varnished or tinned iron, \$3.64 per 100 pounds.

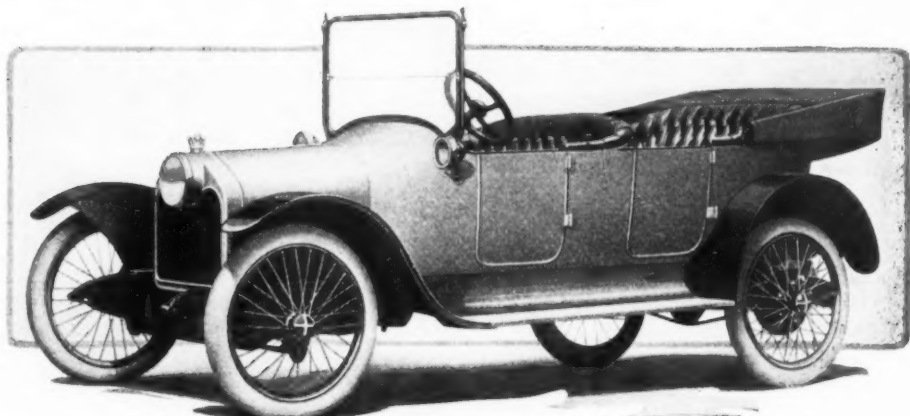
Accessories are assessed according to the material of which they are made at the above rate for parts; speedometers are subject to a duty of 10 per cent. ad valorem. Rubber tires are subject to a duty of \$3.64 per 100 pounds. Lamps, bells, horns are assessed \$6.08 per 100 pounds. Motorcycles are classed as bicycles and are assessed \$8.04; in addition, the motor, classified as machinery is assessed 10 per cent. ad valorem; parts of motorcycles, apart from the motor, tires and accessories, are classified as parts of bicycles at \$30.39 per 100 pounds; parts of the motor classified as machinery are subject to 10 per cent. ad valorem; the invoice must show the value of the motor, whether part of a motorcycle, or otherwise; tires are assessed \$3.64 per 100 pounds.



Plan view of the chassis on which all body types are mounted

Briscoe Adds Roadster and Coupé

Few Mechanical
Changes—
High-Speed Motor—
Combined
Intake and Exhaust
Manifold—
Streamline Bodies



Five-passenger Briscoe touring car for 1915. Note center headlight.

BRISCOE cars, which are now issuing from the Jackson, Mich., plants of the Briscoe Motor Co. to the tune of about ten a day, are proof of the fact that a high-grade light car of European design can be efficiently manufactured in this country.

Benjamin Briscoe, old-timer in the industry and head of the company bearing his name, did the experimental work and designing of the car in France and exhibited the result of his labors to the American public for the first time at the last automobile shows. The distinctive design and pleasing appearance of the car took the American fancy at once, and with this as a starter the concern has since perfected a far-reaching selling organization.

Changes for Production Demands

Though essentially the same as the experimental models which came over from Europe, the car has been put through its paces at the Jackson factories as well as on foreign soil, and the cars now coming through show some minor differences to meet manufacturing conditions and production demands without in any way detracting from mechanical excellence or appearance.

Outwardly, the single headlight in the center of the top of the radiator shell is perhaps the most distinctive feature, while the streamline body and unbroken curves are in accord with the very latest in the body-making art. French gray with black upholstery have been decided upon for the standard colors, and this combination is very pleasing.

Roadster and Coupé Added

Besides the five-passenger touring car models which were the only types seen at the national shows, the line has been extended to take in a roadster and a coupé, both mounted on the standard chassis. The former is styled the Clover Leaf runabout because the seats are so arranged as to give the appearance of a clover leaf. That is, three may be accommodated, the two outside seats being in line, while the middle seat is somewhat back of them.

Body lines of both the roadster and the coupé are very pleasing. The rear is really of torpedo shape and somewhat similar to the back end of several well-known racing cars, notably the Peugeot. The coupé top is very rakish and low in appearance, though of standard height. Windows are large and are designed to afford the driver views of the road from all angles.

As at first planned, the price of the Briscoe, with electric horn, lamps, accumulator battery, tools, jack and so on, is \$750, and when equipped with electric starter and generator, top and boot, windshield and speedometer in addition the figure is \$900.

Car Weighs Only 1,700 Pounds

The Briscoe is truly a light car, for its weight is 1,700 pounds, despite the fact that the wheelbase is amply long—107 inches. Tread is standard at 56 inches and wheels are of wire, on which are mounted 30 by 3 1/2-inch tires all around.

In accordance with present-day practice, the gasoline tank, of 9 gallons capacity, is mounted in the cowl dash, affording direct gravity feed to the carbureter.

The motor is of the high-speed type, with the cylinders block cast and of L-head form. Bore and stroke are 3 1/8 by 5 1/8 inches respectively, according to the engine an S. A. E. horsepower rating of 15.6 and a stroke bore ratio of 1.64. Due to this ratio, the horsepower developed is greatly in excess of that given the motor by the formula.

The valves are all located on the right and covered in accordance with regular practice by readily removable plates. One feature of this motor which is of note is the covering of the valve pockets by a valve plate which is securely bolted to the main cylinder casting. This single plate makes it easy to expose valves and explosion chambers and facilitates the removal of carbon, not only from these parts but from the piston heads as well.

The moving parts are all substantially made and well balanced. There are two main crankshaft bearings,



Cowl board and control of new Briscoe. Note unique spark and throttle lever control on wheel

while the camshaft is also carried on two. Connecting-rods have two-bolt strap ends and are steel forgings of chrome vanadium composition, properly heat treated. The pistons, each of which carries two diagonally split rings, are cast from special piston metal, which is said to be very light in weight, thus permitting of higher piston speeds without vibration.

Silent Chain Drive for Camshaft

The drive for the camshaft, as well as for the magneto, is of uncommon form in that a silent chain, located at the rear of the cylinder block instead of in the usual forward position, takes care of these parts. There is a single chain which is driven by the crankshaft just back of the rear main bearing, passes over the camshaft sprocket and on to the magneto drive sprocket above. This drive is entirely housed against oil leakage and is located between the cylinder block and the flywheel.

Magneto Protrudes Through Floorboards

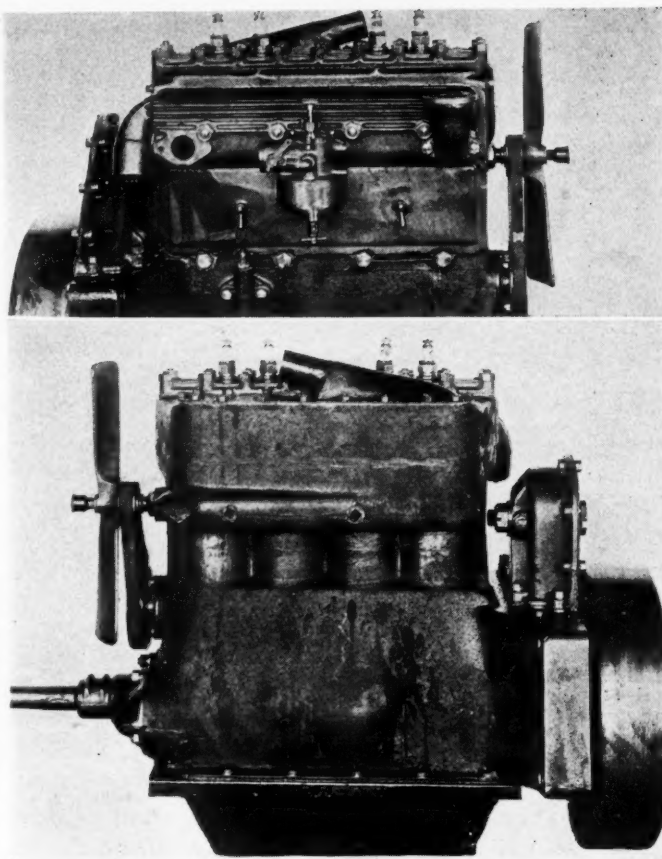
Due to this drive mechanism, the magneto, which is a Splitdorf, Model EU4, is mounted on a bracket attached to the gearcase housing, and in this position naturally protrudes through the inclined floor boards of the front compartment of the car. A metal plate goes over that portion of the magneto which comes through and this may readily be removed for access to the ignition unit. Locating the magneto in this position is not known to American car practice, but it is a departure from usual design.

The lower part of the crankcase may be removed and permits of the inspection or adjustment of the connecting-rod, crankshaft and camshaft bearings. The upper part is in unit with the cylinder block casting, and thus the barrel form of crankcase construction, which is common to American practice, is attained. This design makes a very rigid construction and is another enemy to appreciable vibration.

Combined Intake and Exhaust Manifold

The construction of the combined intake and exhaust manifold, which is placed above the valve cover, is very neat. Being cast together, compactness is attained, and lightness as well. The intake passages are above those distributing the gases internally to the intake ports. The combination also serves to heat the incoming gases, due to their proximity to the exhaust and better vaporization is the result.

Due to this manifold arrangement, the carburetor flange bolts directly to the opening at the center of the intake portion of the combination and there is the least possible amount of exposed piping. Of course, this rather high mounting of the carburetor on the motor is made possible through the fact that the gasoline tank is considerably above it in the cowl. The carburetor used is a Holley.



Upper—Valve side of Briscoe motor, showing combined exhaust and intake manifolds

Lower—Left side of motor showing simplicity of casting

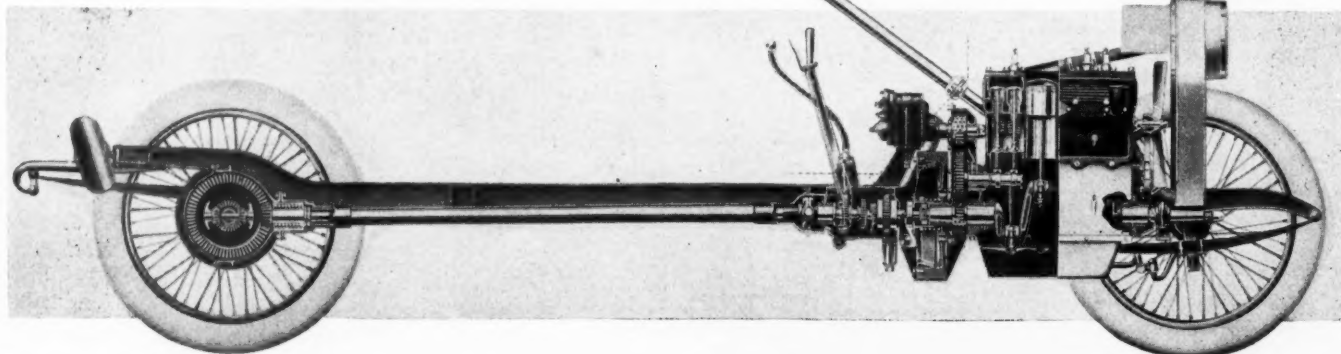
Lubrication is provided for by the conventional form of constant level splash system, there being a separate trough under each connecting-rod to take care of the splash function, while a pump on the right side of the crankcase and operated by the camshaft keeps the troughs at the proper level. The lower part of the crankcase is the reservoir, and the flow is checked by the dash sight feed.

Thermo-Syphon Cooling

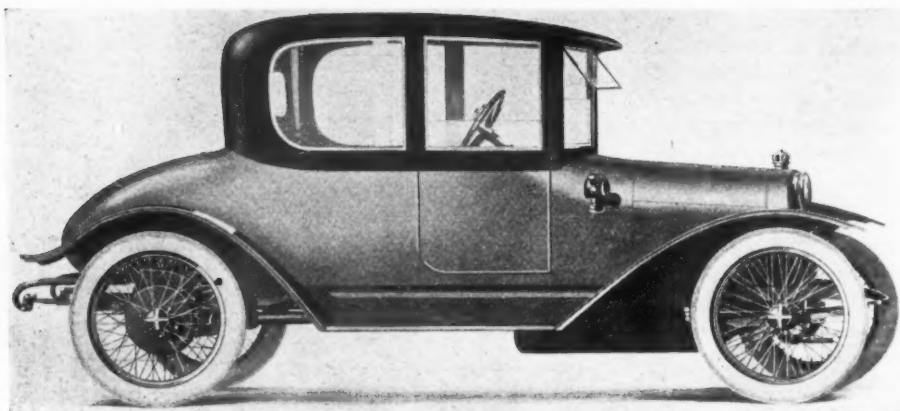
Cooling is by thermo-syphon and inlet and outlet connections are of large diameter to afford a free flow.

Although the flywheel is not inclosed, a substantial yoke passes around it on either side and these arms carry the gearbox. Thus the latter is virtually in unit with the motor, and a three-point suspended unit power plant construction is attained.

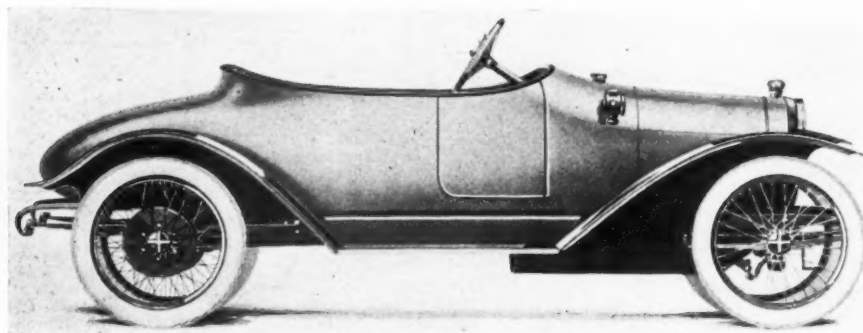
The clutch is of the leather-faced cone type and



Part sectional view of Briscoe chassis on which are mounted touring, roadster, or coupé bodies. Note mounting of magneto on bracket above gearcase and protruding through front floorboards as shown by dotted lines



New Briscoe coupé. Note streamline front and torpeda-type rear as well as general low appearance



Briscoe torpeda three-passenger roadster, called the Clover Leaf because of the seating arrangement

acts within the flywheel rim. Back of it is a three-speed gearset of compact design. This is of selective type and has center control. The gears and shafts are made of chrome vanadium steel.

Combined Starter and Generator

To the right of the gearbox and bolting to the right arm of the yoke passing around the flywheel is placed the Aplco combined electric cranking motor and generator. This unit connects through a completely inclosed silent chain to the main driveshaft between the clutch and the gears in the gearbox. The ratio between this electric unit and the shaft is 2 1-2 to 1. As is usual with combination motor-generator units, the device draws on the storage battery for starting purposes, and, when the engine runs under its own power, becomes a generator for sending current back to the battery.

An automatic cutout switch takes care of the battery charging and cuts the generator into the charging circuit at 14 miles an hour. As a motor the device will turn the crankshaft at the rate of about 150 revolutions a minute, and is unusually silent while doing it. The Aplco unit is of the 12-volt type and the battery, which is placed under the rear floorboards, is rated at 12 volts and 35 amperes. Fourteen-volt side and tail lamps of 2 candlepower are fitted, while the single headlight is a 7-volt, 18-candlepower one.

Driveshaft Is Inclosed

The drive from the gearbox to the rear is through a torsion-tube-inclosed shaft equipped with a universal joint, also inclosed at the forward end. The tube takes the drive and the torque in the usual way, and the power goes direct to the bevel gears of the rear axle which is of the floating type with live axles accepting only the drive. The weight of the car is carried on 4-inch Hyatt roller bearings and there is also a ball thrust bearing independent of the live axles. Although the standard drive ratio is 3 3-4 to 1, the purchaser may have a 4 to 1 ratio, if he desires. The axle gears are also carried on Hyatts.

There are two internal expanding brake drums and shoes on each rear wheel, one operating from emergency and the other from the service brake control. Steering is on the left and mechanism is of the worm and gear type, mounted upon a trunnion and forged from vanadium steel. Rather unusual spark and throttle controls are used on the steering wheel. These are not used with a lever and quadrant construction, but simply rotate on the steering post center. The spark control is a button which may be turned, while a large ring outside of it turns to control the throttle.

The suspension of the Briscoe chassis is by means of semi-elliptic springs all around. In the rear, spring horns attach to the frame and take the rear ends of the long springs. Easy riding is claimed, due to the length of these members.

The frame, which kicks up at the rear to clear the axle, is made of special frame steel having a channel section 3 3-4 inches high and 1 1-2 inch wide and made of 5-32-inch metal.

Some of the principal motor dimensions are given:

Valve diameter—1 3-4 inch.

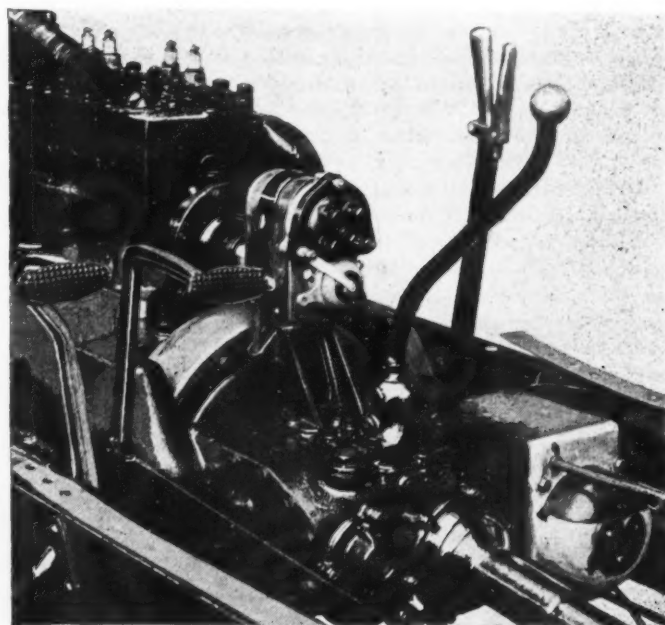
Crankshaft bearings—Front, 1 7-8-inch diameter by 3 inches length; rear,

1 7-8-inch diameter by 3 1-8 inches length.

Connecting-rod bearings—1 7-8-inch diameter by 1 3-4 inch length.

Connecting-rod length—10 1-4 inches center to center.

NEW YORK CITY, Aug. 21—The Bosch Magneto Co., this city, reports that the European war will not hamper it in getting out its product. It states that the raw material which it has been getting heretofore from Europe it is now getting from domestic markets.



Mounting of magneto on bracket above gear case on new Briscoe, showing location of the combined starting motor and lighting generator

Krit Adds Cabriolet—Lowers Prices

Touring Cars and Roadsters \$55 Less—Motor 25 Per Cent. More Powerful—Bodies More Roomy—Center Control

ALTHOUGH the price of the 1915 Krit models has been materially reduced, still greater refinement has been accorded them. Continuing the same general attractive outward appearance as in 1914, they have larger and more roomy bodies, a more powerful motor, better and most complete equipment and a number of detail chassis alterations leading to greater efficiency.

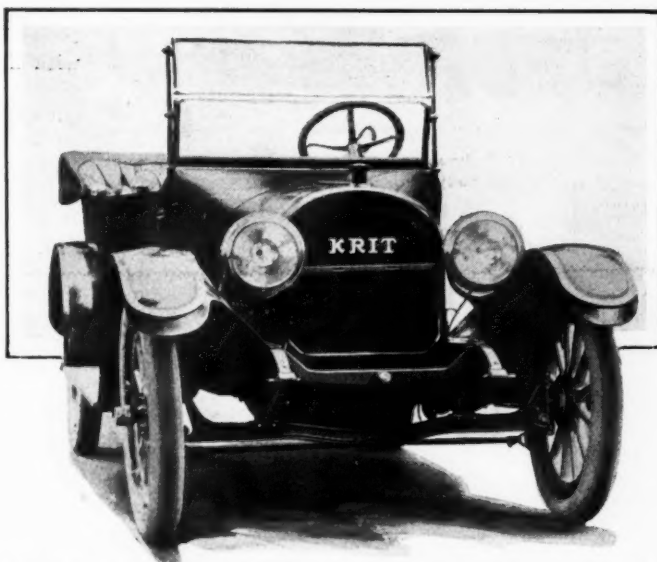
The price on the roadster and touring car models has been reduced from \$1,050 to \$995 with full electric equipment for cranking and lighting, one-man top, non-skid rear tires and additional instrument board units. Besides these two body styles, the Krit company has added a cabriolet type to meet a growing demand for such an all-weather machine. This is to sell for \$1,295. The special touring car and roadster which were well received last season have their successors in the 1915 line also. In either roadster or touring car form, the special sells for \$1,070 with five wire wheels, leather-faced seat covers and optional color in addition to the equipment with which the regular models are fitted.

Fenders Are Crowned

While the body lines are substantially the same as they were, a trifle has been added to the width, while the touring car has been increased 4 inches in length to give more room, most of which has been accorded the front seat. Another distinctive touch which adds to the effect of the streamlines is the crowning of the fenders, a touch which nearly all makers are now recognizing as meritorious. Rounded top radiator with coped over edges and sloping hood which conforms to it have been unchanged.

One new body feature is the doing away with all mouldings along the top edges. Instead, the metal of the sides rounds over the top edges and lends a very smooth and clean look to the car. Door tops conform to the same idea. This construction makes a better manufacturing proposition and at the same time is advantageous both from the standpoint of appearance and serviceability.

In the motor, while the basic design is retained, a new oiling system has been incorporated which



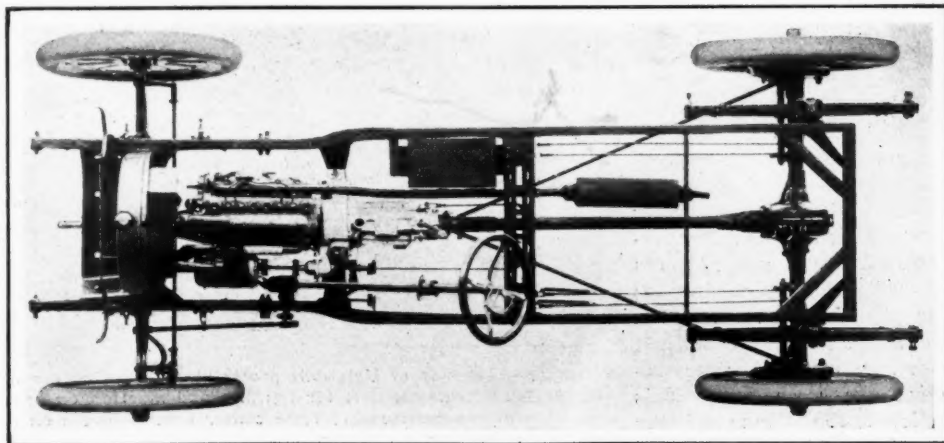
Front view of 1915 Krit touring car, showing stream lines, rounded-over radiator and crowned fenders

combines the flywheel pump system which was heretofore used along with a pump circulation. It is a combination of force feed and splash. In the new arrangement, the reservoir which forms the lower portion of the crankcase is open on top with the exception of four troughs, one beneath each connecting-rod. The oil is positively forced from the reservoir to each of these troughs by a gear pump attached to the front end of the magneto time gear shaft. The rods dipping in the troughs cause a splash, lubricating all parts of the motor, and, as each trough is supplied independently by a lead from the main oil manifold running along the inside of the

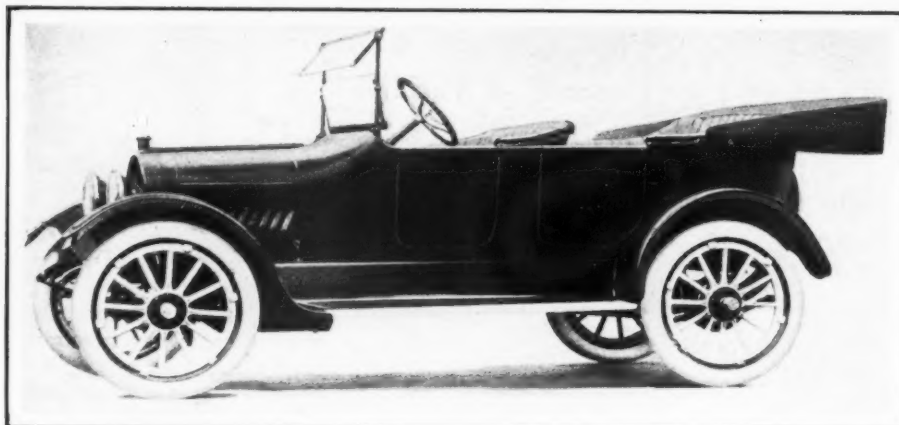
crankcase, the lubrication of each cylinder is assured, whether running on the level or on any kind of grade. The flywheel system which was heretofore used alone, now is the secondary supply, so that lubrication is very effective.

North East Electrical Unit

An important change has been made in the electric equipment, a North East single unit system replacing that fitted last year. This new motor-generator is 38 pounds lighter than the corresponding unit heretofore used. It is mounted on the left forward side of the motor on a bracket integral with the crankcase. This unit connects to the crankshaft through a shaft running back to a sprocket which in turn connects with another sprocket on the crankshaft and between its rear end bearing and the flywheel. The whole chain mechanism is completely housed within an integral ex-



Plan view of Krit 1915 chassis, showing bottle-neck frame, center control, fore and aft steering mechanism and mounting of North East electrical system at left of motor



Side view of 1915 Krit five-passenger touring car, showing streamline form and absence of side lights and of moldings along top edges of the body, the metal of the sides rounding over the top edges

tension of the flywheel housing. The shaft running from the electric unit to the upper sprocket is fitted with two leather universal joints. The ratio between the motor-generator and the crankshaft is 2.96 to 1.

The unit operates in the usual way. When used for cranking purposes, a switch sends current from the storage battery to the unit, it being temporarily transformed into an electric motor. After the engine is running, then the unit becomes a generator and sends current back to the battery. The latter is a 120 ampere-hour Willard and is located to the right of the gearbox inside the frame and under the front floor boards. The new cranking system is very silent and turns the engine at 175 revolutions a minute. On test, it rotated the shaft for 51 minutes with a fully charged battery. The system is a 12-volt, two-wire type.

25 Per Cent. More Power

Some 25 per cent. has been added to the power of the motor, through the increasing of the valve size from 1 1/4 inch to 1 3/8 inch diameter; through the light weight pistons, each of which carries three concentric rings, and through the redesigning of the camshaft to allow for wider valve opening and closer tappet adjustment.

Center Control Adopted

Three chassis changes are of special note. First of these is the shifting to center control from the former left position of the levers—the Krit company has always advocated left drive since its inception in 1909. Second is the adoption of fore and aft steering mechanism to replace the cross type. This relieves the frame of the steering side thrust and therefore makes steering easier. The fore and aft

steer is practically standard with the majority of American cars now. Another improvement is in the center cross member of the frame which this year houses the brake cross rods and levers, relieving them of twisting strains and cleaning up the chassis.

The Krit motor, which is of the block cast type with L-head cylinders, has a bore of 3 3/4 inches and a stroke of 4 inches, giving it an S. A. E. formula rating of 22.5 horsepower, although due to the high speed design with light reciprocating parts, the engine will develop close to 30 horsepower on the block. Its maximum power output is attained at a crankshaft speed of about 2,000 revolutions, although it can be run as high as 3,100 revolutions.

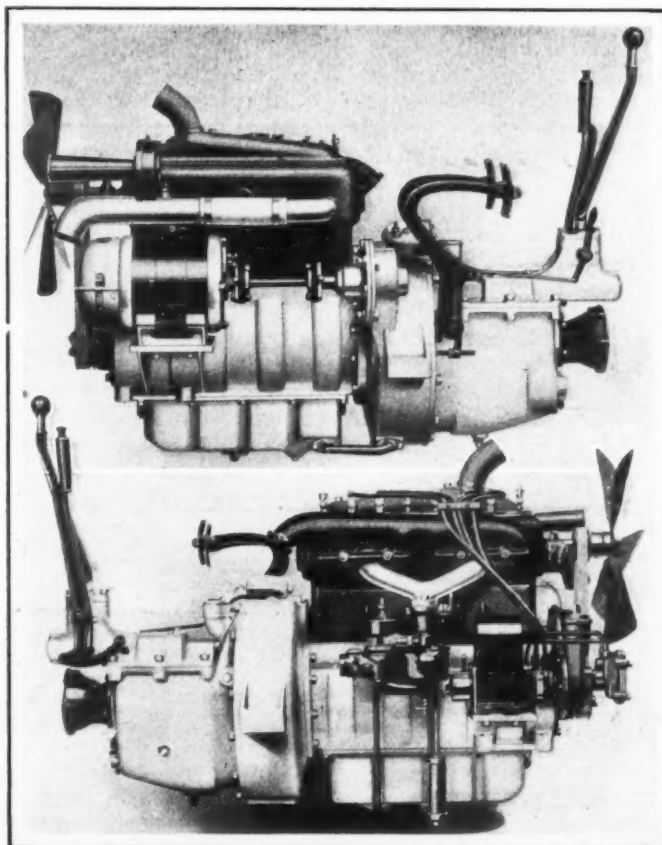
In general construction, the motor is entirely conventional. The unit power plant idea is carried out by bolting the gearbox directly to the flywheel housing, supporting the unit at either side of this housing, and cradling the front end on a frame cross member at its center. Valves, magneto and carbureter are on the right, and the exhaust manifold, with a separate opening to each cylinder, runs above the two branch intake, which has a common opening for each two cylinders. Due to a new design of Stromberg carbureter fitted this year, the shortening somewhat of the intake manifold has been made possible with better carburetion the theoretical result. The magneto is of the Bosch high-tension type.

One distinctive feature of the Krit motor is the mounting of the crankshaft on two annular ball bearings of S. R. O. make. This design has proven very satisfactory, it is said.

Aluminum Cuts Weight

Due to the great amount of aluminum used with the motor, the Krit engineers believe they have reduced the power plant weight to the minimum, although strength is increased by the use of this material. The crankcase, gearcase, oil reservoir, water pipes and intake pipe are of cast aluminum, and the total weight of the engine, with magneto and carbureter, is 276 pounds. The complete gearset weighs 73 pounds, and the electric unit 45 pounds, bringing the total weight of the unit power plant to 394 pounds. This lightness is commendable and leads to greater car efficiency.

The drive back from the motor is through a multiple saw steel disk clutch which is within the flywheel. The housing of the latter is connected by a pipe to the oil reservoir so that the clutch runs constantly in a bath of oil. The drive shaft in the



Upper—Left side of Krit unit power plant, showing mounting of North East electrical unit for lighting and starting on bracket at the side of the crankcase. Note center control levers on gearbox and horn mounted on motor.

Lower—Right side of power plant showing intake and exhaust manifolds, new Stromberg carbureter and Bosch high-tension magneto

gearset is mounted on annular ball bearings and is cut from heat-treated chrome-vanadium steel, the gears, however, being made of chrome-nickel steel, heat-treated and tempered in oil. Their faces are of ample width for their service. The gearbox affords the usual speed changes—three forward and reverse.

Few Changes in Chassis

Except for the few changes in the chassis which have been enumerated, it remains of the same general construction as from the beginning. The drive to the rear axle is through a vanadium steel driveshaft inclosed within a torque tube, and fitted with a Spicer universal joint at its front end. Diagonal radius rods run from the front end of the tube back to the outer ends of the rear axle housing, and they, together with the tube, take the drive and the torque and preserve the proper alignment of the various units.

The rear axle is of the semi-floating type and Hyatt roller bearings are fitted, with a ball thrust bearing on the drive pinion. The brakes are of the usual internal expanding and external contracting type acting upon 10 by 2-inch drums. Rear springs continue to be of the elliptic type, underslung from the axle. Their rear ends are of the scroll form, and this suspension makes for resiliency and consequently for easy riding.

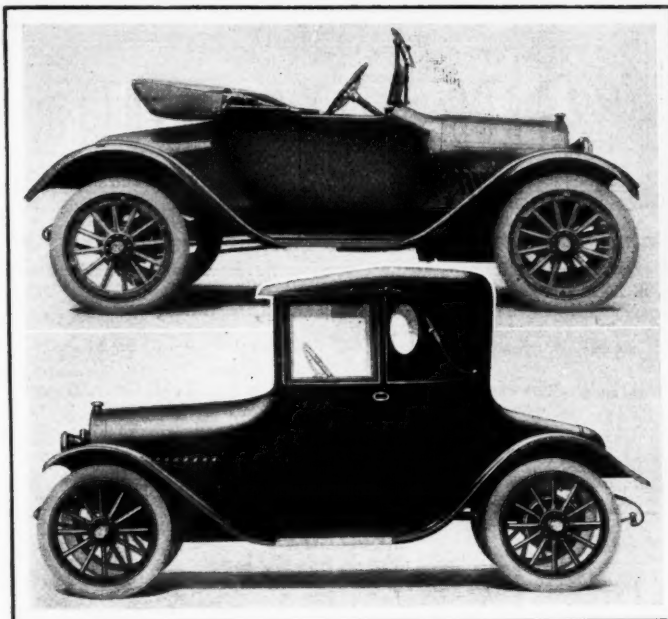
The frame is made from specially heat-treated steel, 5-32 inch in thickness, with a channel depth of 3 5-8 inches. It is of the single-drop type and curves in at the front end in bottle-neck form, thus providing for lower center of gravity and a short turning radius—29 feet 4 inches. There are three frame cross members.

All Instruments Grouped

The gasoline tank under the cowl and hidden by the leather-covered instrument board, through which projects the filled pipe, was a feature of the 1914 Krit and is retained without change for 1915. There is capacity for 10 gallons for direct use. A new feature, however, is the grouping of all the dash instruments on a single plate which is mounted on the instrument board. Containing gasoline gauge, Stewart speedometer, ammeter, switches and carburetor air control, this arrangement makes it easy to illuminate all the devices by the one dash lamp, which is added this year.

Bodies Are More Roomy

Roominess in the bodies is very noticeable, and due to the increasing of the size of the front compartment, it has been possible to lower the front seat—an item for better appearance and greater comfort. Doors have been widened, and ready access from any point is thus augmented. A new design of spare tire carrier is provided which is very rigid.



Upper—New Krit roadster, showing streamline design. Note rear deck and graceful lines of crowned fenders

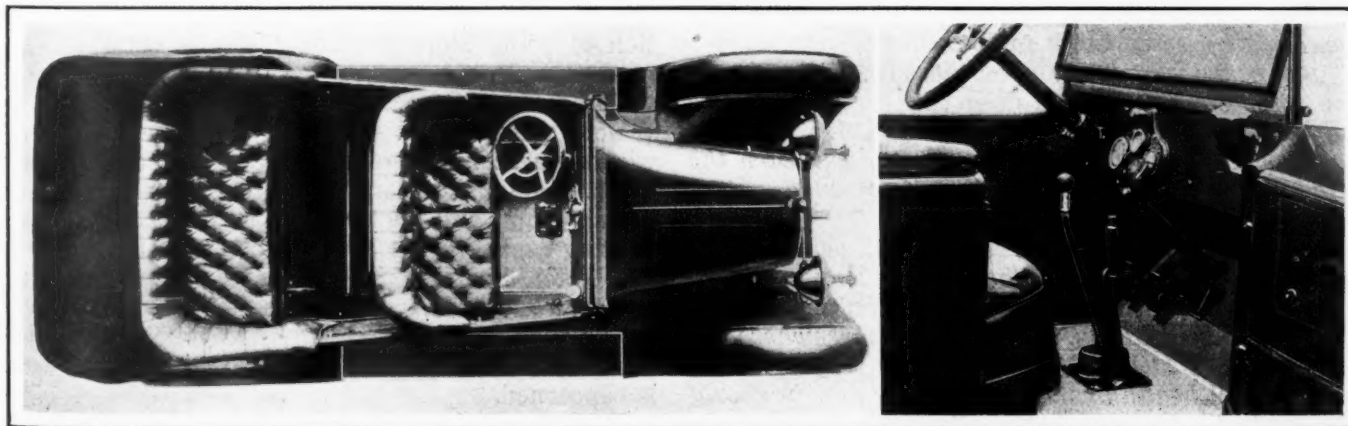
Lower—New Krit cabriolet which is added to the line for 1915. It is designed to meet the growing demand for an all-weather vehicle. It sells for \$1,295

National Automobiling School Created in Honduras

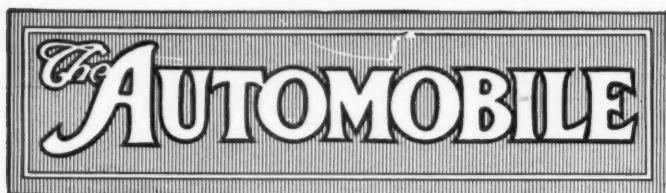
NEW YORK CITY, Aug. 22—On July 4, 1914, the president of Honduras issued an executive order creating a school of instruction for automobilists, to be known as Escuela Nacional de Automovilistas, with the object to teach, theoretically and practically, the construction, working and handling of automobiles.

Applicants for the training must present certain qualifications of good conduct, education and health, and after a 3 weeks' probationary trial may be accepted as matriculated students. When the course is completed an official certificate of his qualification will be given the graduate. The result may be to create a demand for automobiles in Honduras. Only a few machines have ever been imported. Correspondence with the school should be in the Spanish language, if at all possible.

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WICHITA, KANS., Aug. 22—Local automobile and accessories dealers have decided to promote an automobile, parts and accessories show to be held in the Forum in October.



Left—Plan view of Krit five-passenger touring car, showing center control. Note absence of side lights. Right—Driver's compartment of touring car, showing grouping of all instruments on a single plate illuminated by a small electric lamp. Note gasoline tank filler at right of instrument board. Note center control



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Stamina Is Needed

It is more difficult to develop export business today in South America than it has been for some years, notwithstanding so many European factories are closed and that apparently South America will have to look to the United States.

Unfortunately, today South America is short on finances. Europe has been her banker, and when your banker goes back on you it is difficult to get money to purchase automobiles. America may first have to loan to South America much of the money with which we expect it to do business with us.

But even loaning money on these conditions is not an impossibility. These days call for the exercise of business courage, and the men and the organizations who put their money to this use will earn the trade they win and at the same time render patriotic service.

With the exception of commercial vehicles, the automobile industry is stagnant in Europe. The people do not want to purchase cars. They are hoarding their money. We must look elsewhere for markets, and although these markets may not be in their usual healthy condition, master efforts should be made to develop them. We must clear up the atmosphere in South America, wipe out the remembrance of extravagantly high prices on American cars, and of inadequate service for those already

sold. This course is not specially remunerative, when considered in conjunction with the fact that some of the South American countries are declaring a 3 months' moratorium. But it is our task. Let us apply ourselves capably to it.

Racing Interests

LAST Saturday's road race on the 8-mile Elgin course once more demonstrated that the interest of the public in speed contests is not over. The attendance was greater than at any previous race in Elgin's 5 years of racing. This was not expected, many believing that the war situation would reduce the attendance perhaps 25 to 35 per cent. But the crowds were greater on both days than in previous years, and the public once more gave assurance that it is interested in speed contests, where competition is seen.

Although many attend races primarily to witness the spectacle of specially-designed racing cars travelling along the highway at upwards of 95 miles per hour, it must be remembered that these spectators carry home many impressions of the race that have a direct influence so far as their attitude towards automobiles goes.

For example: The car that makes the 300 miles without a single tire change, tells its lesson as compared with the slower car that makes five changes in the distance. Why does one car use more tires than another? This is the question on the lips of the interested owner-spectator. To him tires mean money. His annual tire expense is far in excess of his fuel and oil outlay. Perhaps the tire bill exceeds that of his garage. Little wonder, then, that he is vitally interested in a racing car that performs so admirably. To this spectator racing has a prodigious value. It has a direct dollar-and-cents interest to him.

But we can go further: Generally the racing car that is easy on tires, holds the road well, and travels 80 or 90 miles per hour over the roadway with scarcely a bounce, whereas other cars, changing tires and travelling little over 75 miles per hour, are bouncing from side to side. The car owner is interested in personal comfort. The car that holds the road appeals to him. It is more comfortable than the one bouncing from side to side. But in addition to being more comfortable it is safer. What more desirable factor of safety is there than that which causes a car to cling to the roadway?

Both safety and easy riding can be accomplished without a manufacturer entering in road or track races. One maker can learn the lesson through his racing team, and another can learn it in his engineering department. It is an open question which is the better, but it remains an undisputed fact that the roadway race is the great demonstrator to the public that many of our cars are yet far from the eventual so far as their ability to cling to the road is concerned.

It is most valuable to have these great object lessons, such as afforded by contests, where the public can have these merits in car construction demonstrated to them convincingly.

Downward Tendency in Tires —Companies Renew Old Prices

Supply of Crude Rubber in Sight Still Low But Market Recedes from Last Week's High Level

NEW YORK CITY, Aug. 25.—The tire situation shows an appreciable improvement. Prices in several instances have fallen back to list and the present tendency is downward rather than upward.

Goodyear, which led the advance with 20 per cent., fell back to list Tuesday, August 18, with the explanation that it had secured means of obtaining crude rubber.

Empire followed August 20 by removing its advance of 12½ per cent., and the Mohawk company and the Miller Rubber, both of which had advanced 15 per cent., returned to the old list August 20.

Sterling has stated that it does not expect to advance.

The crude rubber situation remains much as it was, according to Henderson & Korn, rubber brokers, New York City, with little immediate prospect of material relief. Some rubber has been received in this country from South America in Brazilian ships, and some plantation grade has been received from London. The total, however, is negligible in comparison to what would ordinarily be received.

Para went to \$1.12 and plantation to \$1.10 immediately after the European war broke out, but these prices have fallen considerably. Para is now quoted at about 90 cents a pound and plantation at 75 to 80 cents, although there is little of either available. A small quantity of plantation from London sold as low as 72, but is not indicative of market conditions. Shipping and exchange, the prime causes of the shortage, show little improvement.

One hundred employees at the Hartford, Conn., plant of the United States Rubber Co., who were laid off when the war opened, have been taken back; the company expects an increase in business.

S. A. E. European Trip Postponed Indefinitely

NEW YORK CITY, Aug. 25.—The Society of Automobile Engineers has postponed its second European trip indefinitely. The sailing date had been set around October 10 and the first stop was to have been Paris, but present war conditions have brought forth the postponement. The trip, as outlined, extended through France, Italy, Switzerland, Germany and England.

Colonies Are Buying Cheaper Cars

WASHINGTON, D. C., Aug. 22.—Shipments of motor cars and parts, except engines and tires, to the noncontiguous territories of the United States during various comparative periods, are shown in figures compiled by the federal bureau of statistics. During June last 14 motor cars, valued at \$13,737, and parts valued at \$750, were shipped to Alaska, as against 8 cars, valued at \$7,585, and parts, valued at \$931, shipped there during the same month of last year. During the fiscal year ended June, the shipments of cars increased from 16, valued at \$18,435, in 1913, to 54 cars, valued at \$60,930, in 1914. The shipments of parts increased from \$3,020 to \$7,505.

Sixty-three motor cars, valued at \$59,199, and parts valued at \$7,040, were shipped to Hawaii in June last, while in June a year ago the shipments amounted to 54 cars, valued at \$70,413, and parts valued at \$6,172. During the fiscal year the shipments of cars decreased from 718, valued at \$1,182,166, in 1913, to 701 cars, valued at \$841,458, in 1914. Shipments of parts likewise decreased in value from \$107,640 to \$85,813.

Porto Rico received 19 cars, valued at \$17,781, and parts valued at \$4,456 from the United States in June last, as against 16 cars, valued at \$24,729 and parts valued at \$7,114, in June a year ago. The shipments of cars decreased from 323, valued at \$406,440, in 1913, to 291 cars, valued at \$320,680, in 1914, while the shipments of parts decreased in value from \$93,813 to \$70,025.

During June last 42 cars, valued at \$45,646, and parts

valued at \$6,605, were shipped to the Philippines, while in June, 1913, the number of cars shipped was 94, valued at \$105,919, together with parts valued at \$7,195. The car shipments increased from 560, valued at \$668,849, in 1913, to 652, valued at \$761,980, in 1914, while the shipments of parts increased from \$53,434 to \$69,933.

Buick 1915 Schedule of 40,000 Cars To Stand

FLINT, MICH., Aug. 24.—According to president Charles W. Nash, of the Buick Motor Co., the original plans of the company to build 40,000 Buick cars for the season of 1915 will be carried out notwithstanding the war. More than 5,000 men are now employed at the plant and the average daily output is 230 cars. The total value of the 1915 output will be worth about \$42,000,000.

While the European export business will be non-existent, President Nash thinks that other markets will be able to take care of the American made cars.

Peerless 48 Only Six Next Year

CLEVELAND, O., Aug. 26.—The line of large six-cylinder cars produced by the Peerless Motor Car Co. is continued for 1915 by the 48-Six which may be had in an open touring car and a limousine of standard type. In addition a wide variety of special cars fitted to the individual taste of the purchaser may be built on specification.

Convenience has been improved by the adoption of the new style of instrument board in the front compartment which places everything that needs to be touched within easy reach of the driver's hand.

Most important among the many minor mechanical changes that have been made in the car this year is the adoption of the spiral bevel gear in the rear axle. A constant level gasoline tank holding about a gallon is mounted under the cowl to supply an even pressure upon the carburetor under all conditions. The screen in the carburetor has been made removable so that it can be easily cleaned. Dry cells have been provided for emergency starting in winter. A new style of open wiring has been provided for accessibility and to improve the electrical efficiency the single wire system for both starting and lighting with separate fuses for the different circuits, has been adopted.

This year's open car is fitted with a touring body. It is exceptionally wide and spacious and provides room for carrying seven passengers in the greatest comfort. Folding seats of a new and exclusive Peerless design are used for the first time. These are more comfortable than any that have previously been available.

The side lamps have been removed from the dash and placed in the windshield filler board. A new type of glass front has been adopted which has a handle that makes it easy to fold.

The limousine follows the general lines of last year's body of the same type with some improvements in appearance. The front of the roof has a more pronounced curve and the quarter lights in the driver's compartment have been omitted. This leaves the view on either side open.

Windows throughout the car are of the sashless marine type and are fitted with much improved window lifts. All toilet cases and other interior equipment are mounted in and flush with the walls. Two types of auxiliary seats may be had: the special Peerless folding type which disappears into the front wall of the rear compartment when not in use, or the swinging type which folds against the side wall.

Interior lighting has been improved by the adoption of oval corner lamps and a large dome ceiling lamp.

In addition to the standard body types the Peerless Motor Car Company will always undertake the production of cars of special design containing features that are especially desired by the customer. Many extremely handsome cars have been produced in this way. This year special bodies of the Berline limousine, landaulet, Sedan roadster and torpedo types have been designed and can be specified by the purchaser who desires them.

The beetle decked roadster will carry three passengers on the main seat and a fourth upon a folding seat which is ordinarily carried under the deck of the car. The driver's part of the large seat is set forward about 9 inches so that the passengers may have the greatest possible freedom of movement. The five-passenger torpedo is fitted with a divided front seat which permits the passengers to pass from the front compartment to the tonneau without leaving the car. The Sedan also is fitted with divided front seats. It has only two doors, one on the right and the other on the left side of the tonneau.

1914 Deliveries Too Slow for Milwaukee Dealers

Dealers Report Increases in Business from 50 to 250 Per Cent.—Majority Felt a Shortage in Cars

MILWAUKEE, WIS., Aug. 21—With but few exceptions, Milwaukee motor car dealers did the largest business in the history of the local industry during the period from August 1, 1913, to August 1, 1914. The increases range anywhere from 50 to 250 per cent., and in most instances would have been considerably larger but for the fact that dealers could not obtain all of the cars they were able to market. A shortage is reported by more than 85 per cent. of all dealers. The other 15 per cent. consists of that class of dealer who handles approximately the same number of cars year after year and by reason of their peculiar circumstances are content to sell only that many and are not out to make records. Books have just been closed on the fiscal year's business and show a most gratifying situation, particularly so in view of the unsettled state of business during practically all of the period.

Ford, of course, takes the lead, both in quantity of sales and percentage of increase. The Hickman-Lauson-Diener Co., Milwaukee, state agent, has disposed of 5,400 cars since October 1, 1913. Its fiscal year ends October 1, and there seems to be no doubt that the concern will make a 100 per cent. increase over the corresponding period a year ago, when 3,000 cars were marketed. It is only a question of getting cars.

Buick reports a 100 per cent. increase in sales through the Milwaukee branch, 150-160 Wisconsin street. M. J. Monson, manager, states that the 1914 allotment was absolutely sold out March 11, and no sub-dealer in the state has had a car to sell since May 1. What is more, the Milwaukee branch on August 1 had booked orders for 482 of the 1915 models and daily there are new buyers clamoring for more.

A like situation is reported by the Reeke-Osmond Motor Car Co., Milwaukee, which handles most of southern Wisconsin for the Thomas B. Jeffery Co., Kenosha. Business up to August 1, 1914, was 85 per cent. better than for the preceding period, and up to this time the company has booked orders for more than 325 cars of the 1915 type.

The Hoppe-Hatter Motor Co., 539 Broadway, Chalmers, Saxon and Rauch & Lang electric, reports an increase of 100 per cent. in electric vehicle sales and better than 50 per cent. in gas cars. Orders booked ahead are much larger than a year ago, and the only thing the firm is concerned about is getting enough cars to fill requirements.

A 50 per cent. increase is also reported by the Milwaukee branch of Cole Motor Co., 188 Eighth street, and Manager F. E. Tabbert says this could have been increased indefinitely if the factory had been able to supply enough cars.

A shortage of Reo cars is reported by Curtis Automobile Co., 142 Eighth street, which experienced a 33 1-3 per cent. increase, and was sold out long before August 1.

Frank J. Edwards, manager of the Kissel-Kar Co., 178-180 Seventh street, did a business that was 50 per cent. better than the previous year and until 1915 goods arrived booked more orders for future delivery than at any time since the business was established.

Mitchell Automobile Co., 528-532 Broadway, branch of the Chicago wholesale and retail house, is able to report only a 25 per cent. increase in Mitchell business, but this was due to its inability to get more cars. Briggs-Detroit being more liberal, the Milwaukee house was able to swell its percentage of increase on Detroit business nearly 200 per cent. This is for the entire state of Wisconsin territory, while its representation of the Mitchell covers only three counties, Milwaukee, Waukesha and Ozaukee.

Schreiber-Boorse Motor Car Co., 180 Fifth street, reports a 50 per cent. increase on Locomobile and Hudson business. Both lines were dropped August 1, and the National and King substituted. Bookings already made indicate an exceptional increase during the coming year, although it is hardly fair to make comparisons of this kind.

An increase of 57 per cent. in Stutz business and 150 per cent. in Overland sales is reported by George W. Browne, Broadway and Biddle street. Browne's requisition for the new Overland Six and the allotment of the \$1,075 model means even a larger percentage of increase during the coming season.

The Milwaukee branch of the J. I. Case T. M. Co., at 493 Broadway, did a 50 per cent. better business than during the previous

year. The branch is under the direction of the Madison district office, which reports an even larger percentage of increase.

Moline sales were not so large as a year ago, but this is due to the smaller allotment given to the Wait Automobile Co., 222 Fourth street, state agent, by reason of the adoption of the Knight motor and heavy increase in price. William J. Wait said the concern could have disposed of at least 25 per cent. more if the cars could have been granted by the factory. The 1915 allotment has been increased that much.

W. W. Burgett, manager of the Stanley Steamer Co., Fourth and Prairie streets, says he sold twice as many 1914 cars as 1913 models. He had no difficulty in disposing of all the cars the Stanleys could give him. He has recently taken on the Lewis Six and has booked orders to cover all of his 1915 allotment.

The McDonald Motor Car Co., 239 Wisconsin street, reports a 25 per cent. increase in Lozier business. The concern has never experienced any trouble in disposing of the limited number of cars it can get from the Lozier factory and its shortage was greater this year than last.

The American Automobile Co., 187 Wisconsin street, state agent for the Pierce-Arrow, sold just as many cars as a year ago and as it has every year since it took the agency. No effort is made by this concern to break records, its allotment being the same year after year.

Cadillac sales increased 40 per cent., which was the percentage of increase in the 1914 allotment. Jonas Automobile Co., Eighth and Wells streets, has increased its 1915 requisition about the same percentage and expects to meet with the same shortage it has year after year.

The Chase Motor Truck Service Co., 2602-2606 North avenue, increased its 1914 sales 250 per cent. over 1913. Louis Pauly, manager, states that if the cars could have been got from the factory the increase would have amounted to not less than 300 or 350 per cent. Especially in the grocery trade is the Chase popular and Mr. Pauly expects a much larger allotment for 1915, so that his sales record will probably be the same during the coming year as last.

There has been no let-up in purchases since August 1, and there is every indication that the prosperity of 1914 will be duplicated during the coming year. If anyone can doubt the reports of Milwaukee dealers, it is only necessary to study the record of 1914 motor car registrations in the state of Wisconsin. On December 31, 1913, the Wisconsin registration by private owners was 34,646. On August 1, 1914, the registration had passed the 51,000 mark. Registrations expiring at the close of each calendar year, there are no duplications to swell the total. At the present ratio of gain, Wisconsin will show a total 1914 registration of 20,000 more than 1913, or nearly 55,000.

Buick Employees Plan To Eliminate Waste

INDIANAPOLIS, IND., Aug. 19—The employees of the Indianapolis branch of the Buick Motor Co. have organized the Buick Efficiency Society of Indiana whose slogan is: "All together all the time," and whose purpose is to promote higher efficiency among all Buick employees in all matters concerning or interesting motoring.

There are four classes of members, the first being the active members or employees of the local branch; the second membership consists of associates who are the dealers and sub-dealers within the territory looked after by the local branch; employees of dealers and sub-dealers make up the third class, or student members, while the fourth class, or honorary members, is made up of Buick owners.

Among the various important matters which will be taken up by the society is the problem of eliminating waste of materials and expenditures.

Blue Book Establishes New Service Bureau

NEW YORK CITY, Aug. 24—A new touring service bureau has been installed at both the New York and Chicago offices of the Automobile Blue Book Publishing Co. for the free and exclusive use of owners of the 1914 Blue Book.

Any owner of a current issue of the book is entitled to the free use of this Bureau for any kind of advice on any contemplated tour. This service covers the entire territory covered by the five volumes of the book—viz., all of the United States and Southern Canada.

General Motors Made 58,000 Cars in 1914

NEW YORK CITY, Aug. 24—During the fiscal year ended July 31, 1914, the General Motors Co. manufactured approximately 58,000 cars compared with about 55,000 in 1913.

It is understood that the balance of net profits for the 1914 fiscal period will run about 40 per cent. on the \$16,476,000

common stock. This is substantially the same as in the 1913 year.

The export business will not suffer greatly as a result of the war. Only 10 per cent. of the total sales are foreign, and if it were all cut off the loss to net would not be a weighty matter.

Sales manager W. K. Chilcott states that sales made by the G. M. C. Truck Co. for the last half of the fiscal year, ending July 31, 1914, exceeded the same period in 1913 by 44 per cent. Sales for the entire fiscal year ending July 31, 1914, exceed the preceding year 33 per cent.

Sales for July, 1914, exceeded July, 1913, by 137 per cent. Sales for July, 1914, exceeded June, 1914, the record-breaker, 8 per cent. The term sales as used above does not mean orders received, but actual, bona fide deliveries of new models.

The number of dealers handling G. M. C. trucks is 232 per cent. greater than on January 4, 1914. With 32 per cent. less productive labor and 49 per cent. less non-productive labor, the company built 56 per cent. more trucks in June, 1914, than in June, 1913.

Helena Dealers Sell 150 Cars in 1914

HELENA, MONT., Aug. 18—Although every one of the local dealers has received literature about the 1915 models few have received their showroom models and all are trying by all means to get them as quickly as possible, as the business outlook is the brightest ever experienced.

The 1914 business year may now be considered closed since the announcements for the 1915 have been appearing and people do not want to know anything more about this year's cars. It is estimated that 150 to 200 cars were sold all told by the dealers.

The Western Auto & Supply Co., which handles the Ford had contracted to sell fifty of these cars in 1914 and up to date sold sixty-eight, the business being especially good during the last few weeks. The T. C. Power Co., which sells the Buick and Packard disposed of fourteen of the former since March and quite a few of the high priced Packards, which is good business considering that the company only has the western part of the state as its territory. H. La Chapelle, who has the state agency for the National and Apperson is well satisfied with his sales thus far. A very large number of Mitchell cars have been sold by A. D. Mitchell who handles them. While James Walker, the father, runs his grocery store, Edwin Walker, the son, looks after the sales of the Detroit and Jackson cars of which a goodly number were sold during the year. Probably more Franklin cars were sold during the last 6 months by the Swendeman Automobile Co., than during any previous year. The company has the selling right for Broadwater, Jefferson, Lewis and Clark, Meagher and Powell counties.

Wilkes-Barre Agents Sold 818 Cars in 1914

WILKES-BARRE, PA., Aug. 25—Automobiles to the number of 818 have been sold this season by the dealers of Wilkes-Barre and its immediate environs. They range in price from \$395 to \$5,000, the total valuation being estimated at about \$2,000,000. The population in the districts represented by the owners of the cars is about 150,000, which would mean one car for every forty-six families, using the average of four people to a family.

British Engineers' Society Changes Address

LONDON, S. W., ENGLAND, Aug. 20—The address of the Institution of Automobile Engineers has been changed to 28, Victoria street, Westminster, London, S. W.

N. Y. Hupmobile Agent Gets Newark

NEW YORK CITY, Aug. 24—Charles E. Riess & Co., the New York City agent for the Hupmobile car, will open a branch in Newark, N. J., at 373 Central avenue, the same place occupied by the former Hupmobile agency. A service station will be maintained at that location and a complete line of parts will be carried in stock.

Red Head Platinum Point Plug Is \$2

NEW YORK CITY, Aug. 25—In the two-color page advertisement in THE AUTOMOBILE for August 13, the list price of the Red Head platinum point plug was inadvertently quoted as \$1. This is the price of the regular Red Head plug. The platinum point plug lists at \$2.

Wood-Wire Wheel Test Is Pennsylvania Tire Triumph

After 60,772 Miles "Little Is Actually Determined Except Staying Qualities of Tires," Says Report

NEW YORK CITY, Aug. 22—Completing 60,772 tire-miles, the test held for the Pennsylvania Rubber Co. by the Automobile Club of America for the purpose of denoting the relative merits of wire and wood wheels, as related to tire wear, has ended with little actually determined except the staying qualities of the pneumatic tires employed. The test was held under the supervision of Herbert Chase, laboratory engineer of the club.

The test started on March 31 when two new Lozier fours left the Automobile Club of America, one equipped with wood wheels and the other with wire. The cars were operated over the roads of New York City and vicinity until the Pennsylvania vacuum cup tires with which they were fitted wore out. Altogether there were nine tires used in the test, one of which did duty on both the wire wheel and wood wheel car, and therefore cannot be considered in making up resulting figures.

On the wood wheels the four tires which went throughout the test made 5,700, 7,500, 8,940 and 10,164 miles, an average of 8,078.

On the wire wheels the tires made 5,820, 4,300, 9,220 and 6,540 miles. This gives an average of 6,107 miles. The tires were frequently changed from wheel to wheel on both cars.

On the surface this would seem to give an enormous difference in favor of the wood wheels, but such is not the case by any means, as the tires on the wire wheels were subject to accident in the early periods of the run, thereby causing them to blow out sooner than would have been the case were they subject to ordinary wear. In fact, out of the nine tires used, but two perished through being worn out, one of these traveling 10,164 miles and the other 9,228. One of these was on the wood wheel and the other on the wire, showing a difference that cannot be compared owing to the fact that it was a single isolated instance, offering no basis for accurate comparison.

The ninth tire traveled 2,660 miles, at which time it blew out, owing to a cut it had received at the end of the 1,040th mile. As this tire had traveled this distance on the wood wheel, and after being repaired had been transferred to the wire wheel car, it cannot be reckoned in the comparison of mileages.

The Pennsylvania Rubber Co. entered into this test with the idea of demonstrating that a guarantee of 4,500 miles for its casings was not too high. Taking the average mileage of all nine tires, an average of 6,754 miles per tire was covered. The weight of the wood wheel car was 4,150 pounds, and of the wire wheel 4,050 with passenger load.

Outside of the value of the figures obtained on the mileage of the tires, which were secured from the stock of different dealers scattered about the country and which were purchased by the engineering department of the Automobile Club of America, the fact which is really brought home by the tests, that only two of the nine tires perished through being actually worn out; the others were all subject to cuts and bruises which might have occurred at any time during their life and which were subsequently the causes of their failure. In fact, one of the tires was cut and bruised by a sharp stone at 1,040 miles, and although repaired as was allowed under the rules of the test, it blew out at the point of injury at the 2,660-mile point.

No doubt the number of cuts and bruises sustained would be less if the car were run over dirt roads. A summary:

Tire No.	Wheel	Miles Traveled	Cause of Elimination
1.....	Wire	9,220	Worn out; never deflated.
2.....	Wood	8,940	Cut by sharp stone at 7,610 miles; blew out.
3.....	Wood	7,500	Bruised; blew out; never deflated.
4.....	Wire	6,540	Cut by sharp stone at 3,350 miles; blew out at point of injury.
5.....	Both	2,660	Cut and bruised by sharp stone at 1,040 miles; blew out at point of injury.
6.....	Wood	5,700	Punctured by screw at 3,290 miles; blew out at point of injury.
7.....	Wire	4,300	Cut by sharp stone at 2,390 miles; blew out at point of injury.
8.....	Wire	5,820	Cut at 5,690 miles; blew out at point of injury.
9.....	Wood	10,164	Worn out; never deflated.
Total miles...		60,784	Average miles per tire, 6,754.

127 Detroit Cos. Incorporated in 7 Months

DETROIT, MICH., Aug. 20—The Board of Commerce of Detroit has published some statistics concerning local business conditions during the first 7 months of the year as compared with the corresponding period of 1913. It shows among other things that thus far this year 127 companies have been incorporated, or 8 less than last year, but the total capital stock subscribed is \$8,110,400 or \$4,331,820 more than during last year's first 7 months. In this increase of capital stock the automobile industry is far ahead of all others inasmuch as one single concern, Dodge Brothers, was incorporated for \$5,000,000.

The total value of the automobiles, parts and accessories exported up to the end of July was \$5,004,245 or \$86,607 less than for the similar period last year, and represented 16.1 per cent. of the total value of all exports from Detroit, while last year's percentage of the automobile industry in the total exports was only 12.6 per cent.

Armored Autocars for European Powers

PHILADELPHIA, PA., Aug. 25—Armored steel automobiles for use by the European powers engaged in war are being manufactured in this city by the Autocar Co. and will be shipped from its plant at Ardmore as soon as completed. The firm is said to work with the knowledge of Secretary Bryan.

Cars have been sold to nations on each side of the conflict. One order includes fourteen cars for the British Government. These cars are to be shipped to private individuals in Canada and thence reshipped to England.

Negotiations with France, Russia and Greece have also been entered into and it is said orders for 1,000 more cars have been placed by the various powers.

Market Reports for the Week

This week's markets experienced a general advance in prices. Both Bessemer and Open-Hearth steels rose \$1.00 per ton. Electrolytic copper rose \$0.00 1-8 per pound. The larger exports of copper to Great Britain in the last few days have encouraged the producing interests in this city to hold a little more firmly, but the larger supply abroad has resulted in lower prices there. The domestic market continues dull with small demand from domestic consumers. The supply of copper is more than ample to meet current requirements and notwithstanding the decrease in output, current production seems to be in excess of current requirements. Lead is quiet but firmer. Tin has come down to normal prices again. On Tuesday it was quoted at \$39.50 per 100 pounds. The opening price was \$49.00, leaving a \$9.50 cut in price for the week. The demand for tin from domestic consumers is light. Warehouse supplies are a little more concentrated, but more tin is being offered for future delivery. On Tuesday, a steamer from London arrived with 100 tons of tin, while another ship from Rotterdam brought 10 more tons. Rubber has come down to \$0.80. Manufacturers are still holding aloof pending developments.

Material	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's Changes
Antimony	.12	.12	.12	.12	.12	.12	
Beams & Channels, 100 lbs.	1.31	1.31	1.31	1.31	1.31	1.31	
Bessemer Steel, ton	19.00	19.00	19.00	19.00	20.00	20.00	+1.00
Copper, Elec., lb.	.12½	.12	.12	.12	.12½	.12½	+ .00½
Copper, Lake, lb.	.12½	.12½	.12½	.12½	.12½	.12½	
Cottonseed Oil, bbl.	6.53	6.60	6.62	6.75	6.80	6.68	+ .15
Cyanide Potash, lb.	.17	.17	.25	.25	.25	.25	+ .08
Fish Oil, Menhaden, Brown	.40	.40	.40	.40	.40	.40	
Gasoline, Auto, bbl.	.13	.13	.13	.13	.13	.13	
Lard Oil, prime	.93	.93	.93	.93	.93	.93	
Lead, 100 lbs.	3.85	3.85	3.85	3.85	3.75	3.87½	+ .02½
Linseed Oil	.60	.60	.60	.60	.60	.60	
Open-Hearth Steel, ton	19.00	20.00	20.00	20.00	20.00	20.00	+1.00
Petroleum, bbl., Kans., crude	.75	.75	.75	.75	.75	.75	
Petroleum, bbl., Pa., crude	1.50	1.45	1.45	1.45	1.45	1.45	— .05
Rapeseed Oil, refined	.82	.82	.82	.82	.82	.82	
Rubber, Fine Up-River, Para	.90	.90	.90	.90	.80	.80	— .10
Sulphuric Acid, 60 Baume	.90	.90	.90	.90	.90	.90	
Tin, 100 lb.	49.00	45.00	42.00	42.00	39.00	39.50	—9.50
Tire Scrap	.04¼	.04¼	.05	.05	.05	.04¼	— .00½

motorists of the state is thus returned to their home counties to be used for the permanent improvement of highways. Milwaukee county, naturally, has the largest drawback. There were registered from Milwaukee county 8,602 motor vehicles, at \$5, or \$40,010; 130 dealers at \$10, or \$1,300; 1,892 motorcycles at \$2, or \$3,794, a total of \$48,069 received. The return to Milwaukee county is \$33,213.94. Dane county, seat of the state capital, has a drawback of \$10,519.23; Rock county, \$6,655.04; Fond du Lac, \$8,074.26; Racine, \$5,665.90; Sheboygan, \$5,541, and Winnebago, \$5,116.55.

Wire Prices Advance \$1 a Ton

NEW YORK CITY, Aug. 25—The American Steel & Wire Co. has announced a price advance of \$1 a ton on all products to take effect immediately. This is in line with the advance of \$1 a ton made by the Youngstown Sheet & Tube Co.

According to the local wire wheel dealers and manufacturers this will have no effect on the prices of wire wheels.

Approve Claims of 1,641,382 Against Pope Co.

BOSTON, MASS., Aug. 24—Claims aggregating \$1,641,382 against the Pope Mfg. Co. have been approved by the receivers, according to the first report filed in the United States District Court here. This does not include a claim for \$1,000,000 filed by the Empire Trust Co. of New York as trustee for the noteholders, which the receivers have approved for only \$5,000.

The total assets on June 30 last were valued by the receivers at \$1,562,895. Accounts payable on that date aggregated \$60,595.

Since their appointment last November the receivers have sold 21,062 motorcycles and 40,602 bicycles up to June 30 last. They recommend the sale of the plant at Westfield, Mass., at public auction and as soon as an upset price can be fixed they will apply to the court for permission to sell.

Texas Fire Insurance Restricted

AUSTIN, TEXAS, Aug. 24—In a ruling to the State Department of Insurance, the Attorney-General's Dept. has held that a mutual fire insurance company is not authorized to avail itself of the provisions of the law permitting such companies to insure automobile and other motor vehicles. This includes risks against loss or damage by fire, lightning, wind storms, hail storms, tornadoes, cyclones, explosions, transportation by land or water, theft and collisions.

Sparks-Withington Adds 50,000 Sq. Ft.

JACKSON, MICH., Aug. 24—The Sparks-Withington Co., Jackson, Mich., has just completed a structural steel and concrete building at the rear of its plant which gives it 50,000 square feet additional floor space for the exclusive use of nickel plating and shipping departments.

An improvement for facilitating in and out shipments, and relieving the men of the strain caused by heavy lifting, is a concrete pit 10 feet wide by 25 feet long, which permits the automobile trucks to enter freely, bringing the body floor of the trucks on a level with the cement floor, thus enabling the men to run the hand trucks directly to the material and overcoming the necessity of hoists.

Auto Wheel Company Elects

LANSING, MICH., Aug. 20—At the annual meeting of the stockholders of the Auto Wheel Co., the following were elected members of the board of directors: E. S. Porter, H. E. Bradner, Lawrence Price, J. C. Watzel, Elgin Mifflin, Harry P. Woodworth, all of Lansing, and Henry J. Campbell, of St. Joe, Mich. E. S. Porter remains president of the company; H. E. Bradner, vice-president and D. L. Porter, secretary-treasurer. The business year just ended has been satisfactory and the outlook for 1915 is promising. The business of the company has been steadily increasing and from a small factory with only a dozen workmen it has become a concern which now employs about 100 men.

German Cars Predominated at Swedish Show

MALMOE, SWEDEN, Aug. 24—At the exposition which opened in Malmoe, Sweden, May 15, and which it is reported was closed a week after war between Germany and Russia was declared, only four countries exhibited their products in the 117 buildings on the exposition grounds. There were 1,225 Swedish exhibitors, 668 German, 241 Danish and 151 Russian. The German automobile industry took up one-fifth of the total number of German exhibitors as every car, parts

and accessories manufacturers of Germany is reported to have been represented. In fact, it is stated in German publications that never before in the history of the German automobile industry was that country so thoroughly represented. More than 150 complete German automobiles were on display.

Garage Men and Dealers to Meet in Minneapolis

MINNEAPOLIS, MINN., Aug. 24—There probably will be several hundred retail automobile dealers and garage owners in this city September 10 and 11 when the first convention of the Retail Automobile Dealers Assn. of the Northwest will take place. The 2-day affair will be a composite of pleasure and business, it being the object of the convention to be a go-between for the retail and wholesale trade. The association was organized for the purpose of standardizing the retail automobile industry and receives the co-operation of the retail dealers and garage men, on the one hand, and the wholesale accessory and supply houses, distributors and manufacturers, on the other hand. The officers of the association are: C. W. Jewett, Bemidji, Minn., president; G. A. Lewis, Mankato, vice-president; P. C. Frazee, Pelican Rapids, secretary-treasurer.

An Electric Vehicle Day Throughout America?

NEW YORK CITY, Aug. 22—An Electric Vehicle Day, staged simultaneously in a large number of American cities, is being considered by the Electric Vehicle Association of America. It was suggested by Robert Montgomery, commercial manager of the Louisville Gas & Electric Co., Louisville, Ky., and such a day may be held in that city this season. The national project, however, may not mature until next summer.

Montgomery's suggestion is that a certain day be set aside, preferably a holiday, and that parades and demonstrations be held everywhere on that date. Prizes for various com-

petitive features would be offered by the central stations and newspaper and poster advertising would center public attention upon the electric vehicle.

Warships To South America As Sample Cases

NEW YORK CITY, Aug. 24—A resolution was introduced recently at Washington, D. C., by Senator Weeks, of Massachusetts, calling upon the Secretary of Commerce for information as to the cost and feasibility of sending six vessels of the United States navy with samples of American products to South American ports for the purpose of encouraging trade between the United States and the South American republics.

H. T. Sigwalt with Federal M. T. Co.

DETROIT, MICH., Aug. 25—A number of important changes have been made in the organization of the Federal Motor Truck Co. H. T. Sigwalt, formerly with the Fort Wayne Corrugated Paper Co., Fort Wayne, Ind., has joined the company as advertising manager. R. G. Hargreaves, well-known as an engineer, and who was formerly with the Cadillac Motor Car Co., Detroit, has been appointed transportation engineer.

In the sales department the following appointments were made: C. T. Cary, formerly with the Peerless Motor Car Co., Cleveland, O., as manager of its truck department, is now Eastern district sales manager. E. W. Hurd, formerly with the J. D. Whitmann Co. is district manager for the territory comprising Michigan, Ohio and Pennsylvania. L. L. Barnes, formerly with the Chalmers Motor Co., Detroit, is now southeastern district sales manager. Charles Case, who was with the Oliver Motor Truck Co., Detroit, has become southwestern district sales manager.

U. S. Exports Began to Fail in June

WASHINGTON, D. C., Aug. 22—In addition to the general export figures published last week in THE AUTOMOBILE, the following detailed figures show the exports of

commercial and pleasure cars, together with parts, during June and the fiscal year ending June 30, 1914, with comparative figures:

		JUNE—		JUNE—		TWELVE MONTHS ENDING JUNE—		TWELVE MONTHS ENDING JUNE—	
		1913	1914	1913	1914	1913	1914	1913	1914
		No.	Value	No.	Value	No.	Value	No.	Value
Automobiles		115	\$167,391	90	\$120,257	993	\$1,737,141	784	\$1,181,611
Commercial		2,039	2,023,761	1,982	1,870,882	24,293	24,275,793	28,306	25,392,963
Passenger									
Total		2,154	\$2,191,152	2,072	\$1,991,139	25,286	\$26,012,934	29,090	\$26,574,574
Parts of (not including engines and tires)			\$549,616		\$473,968		\$5,240,599		\$6,624,232
		1913	1914	1913	1914	1913	1914	1913	1914
		No.	Value	No.	Value	No.	Value	No.	Value
Automobiles		71	\$54,746	143	\$88,874	824	\$625,795	1,429	\$924,130
France		157	136,171	44	56,249	849	768,418	1,435	1,059,249
Germany		55	33,098	17	13,801	331	280,961	343	242,695
Italy		386	289,457	240	239,274	3,979	3,026,895	7,222	5,853,127
United Kingdom		204	171,783	242	203,816	1,805	1,540,437	2,928	2,337,733
Other Europe		383	596,681	513	642,024	7,212	9,233,561	4,624	5,919,776
Canada		5	9,505	3	4,577	270	506,486	167	256,675
Mexico		23	19,315	65	44,657	438	449,421	556	513,124
West Indies and Bermuda		169	187,185	76	50,683	2,820	3,165,205	1,985	1,939,212
South America		318	187,185	425	369,693	3,062	2,914,451	4,244	3,695,595
British Oceania		206	207,105	147	149,121	2,231	2,151,392	2,140	2,076,278
Asia and other Oceania		177	153,894	157	128,370	1,465	1,349,912	2,017	1,756,980
Other countries									
Total		2,154	\$2,191,152	2,072	\$1,991,139	25,286	\$26,012,934	29,090	\$26,574,574
		1913	1914	1913	1914	1913	1914	1913	1914
		No.	Value	No.	Value	No.	Value	No.	Value
Tires for Automobiles									
Belgium			\$16,470		\$88,874		\$51,620		\$401,900
Germany			28,035		\$6,586		1,160		401,196
England			144,087		192,510		1,177,579		1,125,718
Canada			158,358		168,976		696,433		1,324,459
Mexico			21,603		2,577		148,480		203,883
Philippine Islands			17,597		14,040		73,763		100,476
Other countries			44,975		68,489		508,774		385,588
Total			\$431,125		\$453,178		\$2,657,809		\$3,943,220
									\$3,505,267
		1913	1914	1913	1914	1913	1914	1913	1914
		No.	Value	No.	Value	No.	Value	No.	Value
Imports.									
Automobiles		44	\$105,516	22	\$31,746	748	\$1,759,380	300	\$620,493
Parts of (except tires)			11,996		96,739		263,827		812,083
Total automobiles, and parts of			\$117,512		\$128,485		\$2,023,207		\$1,432,576
		1913	1914	1913	1914	1913	1914	1913	1914
		No.	Value	No.	Value	No.	Value	No.	Value
Automobiles		20	\$45,293	10	\$17,365	357	\$844,392	134	\$304,716
France		9	25,642	2	2,293	99	261,168	21	45,680
Germany		4	7,149	5	5,989	116	205,931	55	79,464
Italy		1	2,300			78	218,932	40	115,042
United Kingdom		10	25,132	5	6,099	98	228,957	50	75,591
Other countries									
Total		44	\$105,516	22	\$31,746	748	\$1,759,380	300	\$620,493

At Last an A. A. Is Formed in Oklahoma

OKLAHOMA CITY, OKLA., Aug. 25—Automobile owners and dealers have perfected a state-wide organization known as the Oklahoma Automobile Assn. Members of the association met at Oklahoma City recently to elect officers and discuss plans for preparing road maps and logs of every county for the owners and tourists visiting in the southwest. Short speeches were made on the question of good roads legislation and plans were laid for concerted effort to procure a revision of the present road laws of the state. A committee was chosen to obtain rooms for offices for state headquarters to be maintained here where residents and visitors can obtain reliable information concerning routes and road conditions.

Officers were chosen as follows: C. B. Shafer, Cushing, president; F. H. Tidman, Oklahoma City, first vice-president; Frank Kraft, El Reno, second vice-president; Directors: J. D. Butts, Cherokee; A. C. Trumbo, Muskogee; J. M. Berry, Tulsa; J. W. Deam, Geary; A. H. Purdy, Bristow; E. I. Eckelkamp, Eufaula, and W. H. Vincent, Foss. F. E. Harkness of Oklahoma City was chosen state secretary.

N. A. A. M. Appoints Committees for Year

NEW YORK CITY, Aug. 24—Appointment of committees to handle various branches of the industry has been made by the National Automobile Chamber of Commerce.

The new appointments just announced by Charles Clifton, president, are as follows: Traffic committee, W. E. Metzger, Argo, chairman; E. R. Benson, Studebaker, and R. E. Olds, Reo.

The patents committee: C. C. Hanch, Marmon, chairman; W. H. Van Dervoort, Moline; William T. White, White, and W. C. Leland, Cadillac.

The commercial vehicle committee: Windsor T. White, White, chairman; Alvan Macauley, Packard, and H. Kerr Thomas, Pierce.

The electric vehicle committee: H. H. Rice, Waverley, chairman; F. R. White, Baker, and W. C. Anderson, Anderson.

The good roads committee: R. D. Chapin, Hudson, chairman, and S. D. Waldon, Packard.

The legislative committee: H. H. Rice, Waverley, chairman; G. H. Stilwell, Franklin, and J. I. Farley, Auburn.

The show committee: George Pope, chairman; H. O. Smith, Premier, and W. C. Leland, Cadillac.

May Have Two Truck Conventions

NEW YORK CITY, Aug. 25—Whether there will be two truck conventions or one this fall will doubtless be decided at the regular monthly meeting of the Board of Directors of the National Automobile Chamber of Commerce, September 2.

Two weeks ago the Motor Truck Club of America announced plans for a motor truck convention to be held October 7, 8, 9, and 10 in Detroit and President George H. Duck of the Motor Truck Club invited the National Automobile Chamber of Commerce to co-operate with it in conducting a convention which will bring together manufacturer, dealer and user.

The Chamber of Commerce had been planning for some time on holding such a convention and at the summer meeting of the directors, held at Christmas Cove, Me., a plan was endorsed for a truck convention to be held sometime in the fall, the date and place to be selected at the September meeting.

The result may be a single convention combining all interests in the truck field or there may be two independent meetings. In the meantime the two organizations are conducting their plans independently, each having prepared a tentative program.

N. Y. Division of Electric Veh. Assn. Formed

NEW YORK CITY, Aug. 20—The New York City members of the Electric Vehicle Assn. of America met tonight at the auditorium of the Consolidated Gas Bldg., and formally inaugurated the New York division of that association with the following officers: chairman, Harvey Robinson; vice-chairman, D. C. Fenner, and secretary, D. F. Tobias. The executive committee consists of the above and the following: W. C. Andrews, T. C. Martin, S. W. Meneffee, Nathaniel Platt, F. S. Sampson, F. W. Smith, S. G. Thomson, C. A. Ward and C. Y. Kenworthy.

The new branch will start off with a membership of nearly 200, which is the largest local in the country. Chicago has



Demonstration of new Buffalo electric before automobile men and electrical engineers

120, Boston 110 and Philadelphia about eighty. In all, the national organization has a dozen local branches at present, and a membership of almost 1,000.

Buffalo Electric Makes Debut

BUFFALO, N. Y., Aug. 23—For the purpose of formally announcing the new Buffalo Electric, the Buffalo Electric Vehicle Company on Aug. 21 entertained several of the more prominent citizens of Buffalo together with representatives of the automobile and electric industry in Buffalo.

Starting from the offices of the Buffalo Electric Vehicle Company, the caravan made a trip of about nineteen miles out to the club house of the Buffalo Automobile Club where luncheon was served. On the trip stop was made on what is known as the Transit Hill—a hill of some length with an average of about 23 per cent. grade and practical demonstrations were made of the ability of the new car to climb the hill as well as demonstration of the fact that in going down the hill it is unnecessary to use brakes of any kind other than the motor. As described before in this new electric, the motor is used for all brake purposes, excepting coming to a dead stop and when coasting down hill or even around curves the motor is transformed into a generator and charges back into the battery.

After the luncheon very brief addresses were made by: A. G. Batchelder, Laurens Enos, A. A. Grey, and Howard L. Spohn.

Baker Electric Makes 130 Miles on 1 Charge

PHILADELPHIA, PA., Aug. 21—A new record for an electrically propelled car was established here yesterday when R. S. Pullen, sales manager of the Carroll A. Haines Co., 2212 Spring Garden street, agents for Baker electric, and S. S. Pancoast, electrical engineer, drove a Baker electric from this city to Atlantic City, N. J., and return on one charge of the battery.

The total distance covered on the one charge was 130 miles. The car was equipped with a Philadelphia storage battery and averaged 15 miles per hour.

Gasoline at 10.3 Cents a Gallon in Kansas City

KANSAS CITY, Mo.—The Sugar Creek Refinery of the Standard Oil Co. of Indiana is operating at the same capacity as before the outbreak of war in Europe. About 1,000 men are employed at this refinery now.

Gasoline is selling here at 10.3 cents a gallon, the lowest price in 4 years. There is strong competition between the Standard Oil Co. of Indiana and minor producers in the local market, and as a result prices have been forced down from 15.5 cents last April to the present level.

About a month ago the Cudahy Oil Co. announced its intention of allowing the members of the Kansas City Automobile Club 1-2 cent on every gallon of gasoline sold at its stations here for their good roads fund. A little later, the Standard Oil Co. of Indiana, here, followed this up with an announcement that this company would give four of the leading Kansas City charities 1-2 cent for every gallon of gasoline sold by it here in August. It is expected that the charities will receive between \$2,000 and \$3,000 from this distribution.

New York City gasoline prices are quoted at 13 cents. New Jersey prices are quoted at 11 cents.

In a war between the Standard Oil Co. and the Indiana Oil Co. at Goshen, Ind., the retail price of gasoline has been reduced from 18 cents per gallon to 9 cents. Every garage in the city became involved.

County Prizes for Fair Motor Attendance

INDIANAPOLIS, IND., Aug. 24—A new feature at the Indiana State Fair, to be held at Indianapolis the week of September 7, will be an automobile contest, which is being arranged for the state board of agriculture, which controls the fair, by the Hoosier Motor Club. This contest will be for thirteen counties in central Indiana, excluding the county in which Indianapolis is situated. The county having the largest number of cars at the fair, Wednesday, September 9 will be given \$100; the county having the next largest number of cars on the ground will receive \$65 and the third largest \$25. The counties are to decide for themselves how the prize money shall be spent.

Two-State Tour Over Pikes Peak Highway

DENVER, COL., Aug. 20—A 635-mile reliability and sociability run is being made this week from Colorado Springs to Salt Lake City over the Colorado-Utah link of the Pikes Peak Ocean to Ocean Highway. Twenty cars, representing eight states, made the start, and after those unable to take the time for the entire run turn back there will still be about a dozen cars to complete the week's trip through the Rockies.

The run is expected to demonstrate the practical feasibility of this new picturesque route across the continent and through the heart of the mountains.

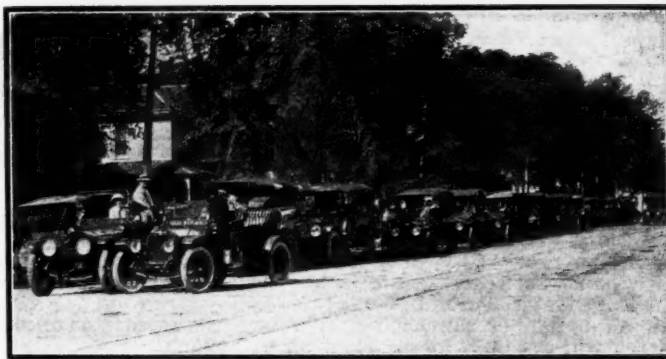
The road goes through Manitou, over Ute pass to Buena Vista and Leadville, then over Tennessee Pass at an altitude of 10,400 feet, where the new grade is only 4 per cent., and on through the splendid scenery of the Canyon of the Grand to Glenwood Springs, through the wild country across from Rifle to Meeker and on across the fertile Uintah Basin and the Utah plateaus to Vernal and Salt Lake City. Mountains, canyons, lakes, rivers and brooks are all along the way, and the road promises to attract a large per cent. of the trans-continental travel by motor.

Several Perfect Scores in Seattle Paper's Run

TACOMA, WASH., Aug. 18—Flying Canadian and American flags, sixteen out of the twenty-one cars entered in the Second Annual Post Intelligencer Tour completed, covering a distance of 593.9 miles in the State of Washington and the province of British Columbia, returning to the starting point, Seattle, on the evening of August 18.



The group at the demonstration of the Buffalo electric at Buffalo, N. Y.: Standing, left to right—1—J. P. Mallett, Engineer, Society for Electrical Development. 2—Henry D. Knox, F. W. Woolworth Co. 3—A. A. Grey, Managing Editor Electrical Review. 4—Richard O'Keefe, Secretary Automobile Club. 5—F. G. Peck, Engineer, Buffalo Electric & Vehicle Co. 6—John W. Van Allen, Wilson & Van Allen, Attorneys, Buffalo, N. Y. 7—Laurens Enos, Ex-President A. A. A. 8—John T. Steele, Organizer, Buffalo Electric & Vehicle Co. 9—H. B. Niblette, Goodrich Tire & Rubber Co. 10—W. A. Zimmerman, Sales Mgr., Buffalo Electric & Vehicle Co. 12—Dai H. Lewis, Secretary Automobile Club. 15—F. T. Turner, Editorial Department Buffalo Times. 17—Howard L. Spohn, Class Journal Co. 18—A. G. Batchelder, Chairman Executive Board A. A. A. 19—W. F. Fuqua, W. F. Fuqua & Co., Bankers, Philadelphia, Pa. Kneeling, left to right—1—E. J. Fouts, City Editor Buffalo Courier. 2—M. M. Wall, president Buffalo Automobile Club. 3—G. K. Rudolph, Managing Editor Buffalo Enquirer. 4—Dan Ferry, Editor Buffalo Motorist. 5—E. E. Denniston, General Manager Buffalo Electric & Vehicle Co. 6—Edward Deltzer, Advertising Manager Buffalo Courier. 7—Frank Bloomer, Assistant Editor Buffalo News



Start of the Colorado White sociability tour. This tour, which was detailed in The Automobile for August 20, started in Manhattan, Kan., and had for its objective the city of Pueblo, Col.

The first competing automobile to arrive was No. 16, a Chalmers, driven by Joe Thomas, and which duplicated its performance of last year. The Chalmers was closely followed by the Franklin with W. A. Wicks at the wheel. Other perfect scores were made by Harry D. Austin in a Metz; George Purdy, Buick; T. F. Barsby, Studebaker, and F. C. Sheraton in a Ford.

Hughie Hughes in a Maxwell "25" drove nearly the entire distance without an adjustment, but on the final day was unlucky in burning up a bearing in the connecting rod. The motor of the car had to be taken down, and for this the racing driver received a penalty of 408 points.

Novelty Racing in Denver Labor Day

DENVER, COL., Aug. 20—A revival of motor car racing in Denver will be witnessed on Labor Day, September 7, when one of the liveliest race meets ever staged in Colorado will be pulled off on the Overland Park course by the Denver Motor Club. The program will start with a race for Fords in a 10-mile dash all their own and finish with a 25-mile landscape-streaking event open to stock cars of all kinds. There will also be some novelty features of exceptional interest to motor car owners, and plans are also under way to put on an exhibition event of powerful racing machines.

The other amateur events, all of which carry prizes, will be as follows: 5-mile race exclusively for the old-timer cars built prior to 1909. Obstacle race requiring cars to dodge dummies, boxes and other obstacles scattered across the track, with a point against the driving score for every obstacle struck. 2-mile trouble race, requiring cars to stop in front of grandstand and change one tire at the end of the first mile. 15-mile open race for cars of not more than 35 horsepower.

The entries so far include several drivers noted for their daring and the meet promises to furnish plenty of thrills. The following will be among those in the final event of 25 miles: E. W. Swanbrough in a Lozier, Eddie Bull in a Franklin, Harry Ball in an Overland, Benny Knott in a Pathfinder, William Thorney in an Apperson, and Jimmie McDonald.

Two-Day Meet for Brighton Beach Sept. 5-7

NEW YORK CITY, Aug. 24—Two days of automobile racing instead of only 1 is scheduled for the Labor Day holidays at the Brighton Beach track. The matinee meet will open Saturday, September 5, and will be resumed on Monday, September 7.

The program for the opening day is to be made up of a number of small sprints, while on Labor Day will be the feature event, the Labor Day Sweepstakes, for a distance of 100 miles and for a purse of \$1,000. This event is to be a class D free for all.

The majority of the star drivers who raced at Elgin have arranged to express their cars East in time to tune them up for the opening meet.

Cyclecar Race for Columbus

COLUMBUS, O., Aug. 24—Arrangements have been completed for a cyclecar race meeting to be held at the Columbus Driving Park, Sunday, August 30. The race meet will consist of about eight events ranging in distances from one mile to an hour race. Ralph S. Breckbill of the Buckeye Cycle Car Company of Columbus is receiving the entries which are coming in well. A. A. A. sanction has been applied for.

Factory Miscellany

TWOMBLY Leases N. Y. Motor Factory—The Twombly Car Corp., New York City, has leased the plant formerly occupied by the New York Motor Works in Nutley, N. J., with an option of purchasing it. The concern will get busy at the plant about the middle of next month. It will manufacture light delivery wagons, taxicabs and town cars.

Will Build Taxicabs—Taxicabs built in its own factory will shortly be put in service by the Spokane Taxicab Co., according to announcement made by Manager G. E. Riegel, of Spokane, Wash.

1,000 Engers for 1915—President F. C. Enger, of the Enger Carriage Co., Cincinnati, O., announces that the company will build 1,000 cars during the coming year.

Acquires Imperial Wheel Plant—The Monroe Motor Co., Flint, Mich., recently incorporated for \$250,000, to manufacture automobiles, has acquired the plant of the Imperial Wheel Co.

2,000 Sommers Motors for Allen—The Allen Motor Co., Fostoria, O., has contracted with the Sommers Motor Co., of Bucyrus, O., for 2,000 four-cylinder motors for its 1915 cars.

New Process Gear Adds—The New Process Gear Corp., Syracuse, N. Y., is taking bids for a case hardening building, 36 by 95 feet, three stories high with a basement, to be erected on Plum street.

Aluminum Co. Enlarges—The Aluminum Specialty Co., of Manitowoc, Wis., which recently added new capital, will erect a new plant, 60 by 200 feet, of brick and steel. It is to be ready for occupancy about September 15.

Besser Purchases Alpena Plant—The

Besser Mfg. Co., Alpena, Mich., has purchased the plant of the defunct Alpena Motor Co., at a receiver's sale. The Besser company, which manufactures concrete mixing machinery, will operate the factory as an addition to the present plant.

Auto Products Co. Will Move—The Board of Trade of Canal Dover, O., announces that the Auto Products Co., Canton, O., will remove its plant to Canal Dover. An effort is now being made to sell \$20,000 of the preferred stock of the company. It is expected the plant will be removed in about 60 days. The company manufactures automobile parts and accessories.

Largest American Diesel Engine Built—The Lyons Atlas Co., Indianapolis, Ind., has recently completed and shipped the largest Diesel engine constructed to date in this country. This engine is composed of four cylinders, 21 inches bore by 30 inches stroke, and is of the vertical, four-cycle type, rated at 600 brake horsepower with an overload capacity of 15 per cent., or 690 brake horsepower maximum.

Detroit Gear Co. Adds—A two-story brick building will be started within a few days as an addition to the plant of the Detroit Gear & Machine Co., 129 Franklin street, Detroit, Mich. The new structure will cost \$22,000. The local concern started in business only 4 years ago with a capital stock of \$100,000, which has since been increased to \$150,000. The business has been steadily increasing and even a very satisfactory foreign trade has been worked up.

Hupp Makes New Additions—Work

has been started on a large addition to the general office building of the Hupp Motor Car Co., Detroit, Mich. When completed, the offices will have about double the floor space which they now occupy and will be one of the finest and most modern office buildings in the city. One of the features will be a new and much larger dining room where the noon luncheons will be served, which have been found by the officials of the company, to be of the greatest aid in effecting close co-operation among the men.

Broc Organization Moved to Saginaw—The entire organization and equipment of the Broc Electric Vehicle Co., Cleveland, O., has been removed to Saginaw, Mich., owing to the recent consolidation of the company with the Argo Electric Co., Saginaw, and the Borland-Grannis Co., Chicago, Ill., into one concern known as the American Electric Car Co., with general headquarters in Saginaw. This company has established a service station at 1976 East 66th street in Cleveland, O., in charge of H. C. Young, formerly with the Broc company.

Blodgett Plant in St. Joseph—The Blodgett Rubber Co., Warren, O., will locate its plant in St. Joseph, Mich. The new concern was secured by the St. Joseph Development Co., which is to furnish a factory site and building which, under certain conditions, will become the property of the rubber company after 5 years. The Blodgett company manufactures a tire of non-puncture variety, under a patented process. W. E. Bryan, a Chicago attorney, is president of the company, and M. D. Wilber, secretary. It is expected to have the factory in operation in 60 days.

The Automobile Calendar

Sept. 4.....Des Moines, Ia., Track Race, Iowa State Board of Agric.
Sept. 5-7.....Brighton Beach Race Track Meet; Motor Contest Dealers' Assn.
Sept. 6-7.....Detroit, Mich., Track Meet, J. A. Sloan.
Sept. 6-7-8.....Newark, N. J., Cyclecar Reliability Tour to Atlantic City.
Sept. 7.....Brighton Beach, N. Y., Track Meet, New York Motor Dealers' Contest Assn.
Sept. 7.....Denver, Col., Track Race, Overland Park Track, Denver Motor Club.
Sept. 7-14.....Indianapolis, Ind., Automobile Show, Indianapolis Automobile Trade Assn.
Sept. 9.....Corona, Cal., Road Race, Corona Auto Assn.
Sept. 9-11.....Convention Paving Brick Mfrs. Assn., Cleveland, O.
Sept. 10.....Portsmouth, Eng., Autumn Conference, Institute of Metals.
Sept. 12.....Hamline, Minn., Track Meet, Minn. State Fair.
Sept. 15-16.....Norfolk, Neb., Track Race, Norfolk Commercial Club.
Sept. 15-Oct. 11.....New York City, Commercial Tercentenary Celebration.
Sept. 26.....Kalamazoo, Mich., 100-Mile Track, Inter-State Fair.

Sept. 27.....Pleasanton, Cal., Track Meet, Alameda County Fair Assn.
Oct.....Philadelphia, Pa., E. V. A. Annual Convention.
Oct. 3.....Fresno, Cal., Track Meet, Fresno Co. Agricultural Assn.
Oct. 4.....St. Louis, Mo., Automobile Show, Auto Manufacturers' and Dealers' Assn.
Oct. 5-12.....St. Louis, Mo., Show, Forest Park Highlands.
Oct. 7-17.....New York City Electric Vehicle Show, Grand Central Palace.
Oct. 17-24.....Pittsburgh, Pa., Automobile Show, Auto Dealers Assn., Inc.
Oct. 17-Nov. 1.....Dallas, Tex., Show, State Fair Grounds, Dallas Automobile Dealers' Assn.
Oct. 19, 20, 21.....Philadelphia, Pa., Elec. Veh. Assn.'s Convention.
Oct. 19-26.....Atlanta, Ga., American Road Congress of the American Highway Assn. and the A. A. A.
Oct. 28-31.....Milwaukee, Wis., Convention, Northwestern Road Congress, Auditorium.
Nov.....El Paso, Tex., Phoenix Road Race, El Paso Auto Club.
Nov. 8-9.....El Paso to Phoenix, Ariz., Automobile Race.
Nov. 8-11.....Shreveport, La., Track Meet, Shreveport Auto Club.

Dec. 1-4.....New York City, Annual Meeting of the American Society of Mechanical Engineers.
Jan. 2-9.....New York City, Annual Automobile Show, Grand Central Palace.
Jan. 3-10.....Buenos-Aires, Argentina, Grand Prize of Argentina.
Jan. 9-16.....Philadelphia Automobile Show.
Jan. 23-30.....Chicago, Ill., Automobile Show, First Regiment Armory.
Jan. 30-Feb. 6.....Minneapolis, Minn., Show, National Guard Armory, Minneapolis Automobile Trade Assn.
Mar. 7.....San Francisco, Cal., Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Mar. 14.....San Francisco, Cal., Panama-Pacific Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Feb. 22.....San Francisco, Cal., Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

The Week in the Industry



Motor Men in New Roles

ECCLESTON Apperson Sales Manager—Apperson Bros. Automobile Co., Kokomo, Ind., announces the appointment of J. B. Eccleston as general sales manager; Howard A. Bauer, assistant sales manager; J. H. Newmark, advertising manager, and Joe G. Roberts, general traveling representative.

Curtis Splitdorf's Boston Manager—The Splitdorf Electrical Co., Newark, N. J., has appointed H. R. Curtis manager of its Boston, Mass., office.

Lebon Jeffery District Representative—M. F. Lebon has been appointed district representative for New York by the Thomas B. Jeffery Co., Kenosha, Wis.

Pickering Manager—L. C. Pickering has been appointed manager of the recently organized Grant Distributing Co., which has opened for business at 514 Grant avenue, Des Moines, Ia.

Canary Houk Chicago Manager—Dan J. Canary has become the manager of the branch of the George W. Houk Co. in Chicago, Ill. The branch is located at 2339 Michigan avenue.

Camp Chalmers N. Y. Sales Manager—A. Roy Camp has been appointed sales manager of the Chalmers Motor Co., of New York. He has been with the New York agency since its beginning in 1908.

Elkin Manager G. M.'s Chicago Branch—The General Motors Truck Co. has appointed Z. C. Elkin manager of the Chicago branch. He was formerly manager of the Thos. B. Jeffery Co.'s Chicago branch.

Paine Made Manager—Charles A. Paine has been made manager of Belcher & Loomis Co., Providence, R. I., succeeding Henry Paquin. He has been 3 years with the company and the change comes as a promotion.

Henderson KisselKar Executive—O. B. Henderson has been appointed vice-president of the Pacific Kissel Kar branch, Los Angeles, Cal. Previously he was general manager for the Baker Motor Vehicle Co., Cleveland, O.

Rutter Detroit Monarch Manager—L. Rutter has taken over the management of the Rutter, Rath & Theisen Auto Sales Co., 761 Dix avenue, Detroit, Mich., which handles the Monarch cars and conducts a service station.

Zimmerman Sales Manager—W. A. Zimmerman has been appointed general sales manager of the Buffalo Electric Vehicle Co., Buffalo, N. Y. Previously he was sales manager of the Mercury Motor Truck Co., Chicago, Ill.

Mollohan Switches to Buick—Charles Mollohan, 5 years credit manager of the *Daily Oklahoman* newspaper of Oklahoma City, has resigned his position to become identified with the city sales department of the Buick Motor Co.

Brown J. M. Special Representative—F. E. Brown has joined the staff of the H. W. Johns-Manville Co., New York City, as special representative to devote his attention to the sales development

of the Noark service-meter protective devices.

Marshall Makes Change—William J. Marshall, formerly president of the Mercury Cyclecar Co., Detroit, has become general manager of H. Collier Smith, 815 Scotten avenue, Detroit, Mich., manufacturer of special sheet metal machinery.

Mauthe Batavia Rubber Representative—F. G. Mauthe, formerly manager of the Goodyear Tire & Rubber Co., in Newark, has become associated with the Batavia Rubber Co., of New York, as special representative in the State of New Jersey.

Henderson Canadian Regal Sales Manager—It is announced by the Regal Motor Car Co., Detroit, Mich., that R. P. Henderson has been appointed sales and advertising manager and Henry Nyberg production manager of the plant in Berlin, Ont., Canada.

Woodin Detroit Abbott Manager—T. C. Woodin, former eastern sales manager of the Abbott Motor Co., Detroit, Mich., has been appointed manager of the Detroit branch of the Abbott Motor Co., the salesrooms being at 467 Woodward avenue.

Birnie Joins Simplex—H. T. Birnie has joined the sales organization of the Simplex Automobile Co., New York City. He was formerly with the Packard Motor Car Co., that city. He succeeds F. H. Bowen, who has become manager of the S. G. V. agency in New York City.

Moore to Handle Rad-Fix—The Radiator Fix Co., Boston, Mass., has arranged with the William M. Moore Co., 1305 Sutter street, San Francisco, Cal., to handle the distribution of its product, Rad-Fix, in that territory. This product is a solution for repairing radiators.

Godbey Assistant Sales Manager—W. H. Godbey, Jr., formerly with the Memphis Motor Car Co., and also with the Ford Motor Co., Memphis, Tenn., has been appointed assistant sales manager of the Premier Sales Co., Memphis, Tenn., which handles the Premier, Oakland and Chevrolet cars.

Hughes Victor Parts Sales Manager—The announcement is made by sales manager W. R. Hughes of the Victor Auto Parts Co., Cincinnati, O., to the effect that in the future the products of the company will be sold direct by the factory instead of through Fulton McCutchan, formerly sales agent.

Dodge Bros. Make Appointments—Harvey Mack, with the Joy Bros. Motor Car Co., Minneapolis, Minn., has signed up for the Dodge car which is to be put in there in the near future. A. C. Templeton has been appointed district representative for Dodge Bros., Detroit, Mich. His district is Minnesota and North Dakota, and parts of South Dakota, Montana and Wisconsin.

Bush Studebaker Sales Manager—Vice-President Benson of the Studebaker Corp., Detroit, Mich., announces the appointment of W. T. Bush, formerly sales manager of a Detroit automobile agency, to be sales manager of the Studebaker Corp., of Canada, Ltd., Walkerville.

Garage and Dealers' Field

Purchase Hupmobile Agency—The Central Iowa Motors Co., Des Moines, Ia., distributor of the Hupmobile, has been purchased by Messrs. W. S. Adams, F. E. Card and H. R. Brown. The business will be continued under the same name.

Flint Sheet Metal Co. Organized—The Flint Metal Specialty Co. has been organized in Flint, Mich., to make sheet metal specialties for the automobile trade and also do a general repair work. The organizers are R. S. Gott, A. S. Allen and E. J. Vining.

Dodge Dealers' Requests Number 5,511—Voluntary requests for dealerships numbered 5,511 when a count was made recently by sales manager Arthur I. Philp and his sales force at Dodge Bros., Detroit, Mich., and it was found that from 60 to 90 per cent. of the first year's allotment of cars had been contracted for in most of the sixteen districts.

Ford Employees' Monthly Banquets—Employees of the Ford Motor Co., Oklahoma City, Okla., hold regular monthly banquets at some leading hotel of the city to discuss efficiency matters. The object of these meetings is not only to obtain the greatest efficiency among the employees but it is also for the purpose of working out various plans for the benefit of the Ford owners, especially for those within reach of the local office.

300 Chauffeurs Offer Military Service—At a meeting of the Toronto Chauffeurs' Protection Assn., Toronto, Ont., 300 men offered their services to the military authorities. A letter sent to Major General Lessard from the meeting, stated that of the number thirty were ready to leave at once, men of experience who could handle and do mechanical repairs on every kind of motor vehicle. Several of them had had military training.

Oklahoma City's Safety Plan—The automobile dealers of Oklahoma City, Okla., are discussing plans and co-operating with police authorities in preventing accidents there in preparation for the state fair by conducting a Safety First campaign. The members of the association propose not only to obey the law but to assist the authorities in breaking up speeding and hilarious joy riding. The state plan proposes that pamphlets be printed containing local laws in various parts of the state and be handed out by the gasoline dealers to drivers and tourists.

N. Y. Hupmobile Owners Reunion—A grand reunion of all Hupmobile owners is being planned by Chas. E. Riess & Co., of 1690 Broadway, New York City, on September 9. Invitations have been sent out to all Hupmobile owners in this section to be the guests of Chas. E. Riess & Co. at this reunion, and, so far, over 150 acceptances have been received. All will meet at 2.30 p. m. at 135th street and Riverside Drive, and will then proceed to Coney Island, and dinner will be served on the Upper Deck Banquet Hall, Brighton Beach Casino, Brighton Beach.

Accessories for the Automobilist

FIRESTONE Ford Demountable—A demountable rim, Fig. 1, made specially for Ford cars is now made by the Firestone Tire & Rubber Co., Akron, O. To remove the rim it is only necessary to take off five nuts and therefore it is stated that a tire change can be made in 5 minutes. The rims are furnished complete with wooden wheels so that to install a set it is merely necessary to unbolt the hub flanges, take off the old wheels, put on the new ones with the demountable rims. The price complete is \$25.

H-M Light Controller—The glare of the headlights is avoided in the device shown in Fig. 2, by means of frosting the upper part of the headlight glass to a point slightly below the center. Thus no strong, dazzling beams of light pass above the horizontal. The light diffused is not wasted but illuminates the roadway near the car, throwing the rays to both sides and thus aiding the driver when turning corners. It is made by Howard F. Mulcahey, 8 Mt. Vernon street, Providence, R. I.

Automatic Lamps—Increased safety when driving at night is obtained by the use of lamps that are designed to turn with the wheels and thus illuminate the roadway when making turns. The device shown in Fig. 3, consists of a special set of brackets that are clamped to the front of the car, a lever running to the tie rod. The device is made by the Automatic Lamp Control Co., 423 East First street, Dayton, O.

Noll Pneumatic Starter—A pneumatic cranking system, Fig. 4, in which the motor is started by means of the outward movement of a piston, which pulls on a cable and thus turns the motor over several times has just been announced.

A dust and waterproof case, 7 by 7 inches, containing the starter gearing and air compressor, is attached to the engine shaft in front of the radiator, and held in position by means of a bracket which is fastened to the frame.

The air compressor consists of a two-cylinder unit cast in a block and air-cooled, with pistons of cast iron having three snap rings, which are made from a hard alloy. The pistons and yoke form a complete unit and are operated by a specially designed movement which does away with connecting-rods.

All bearing surfaces consist of steel and bronze, one of the best combinations known to mechanics. There are no chains, gears, or sprockets, nothing to break.

The whole is lubricated by the well-known splash system which has proven so efficient in automobile construction.

The starting mechanism is controlled

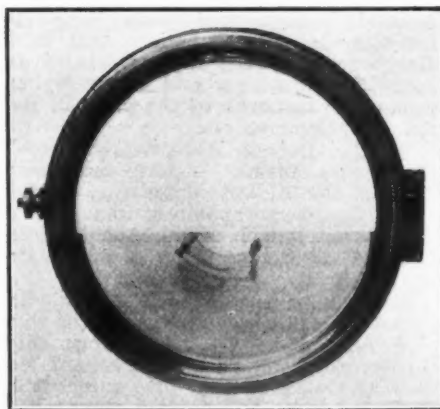


Fig. 2—H-M light controller, a dimming device

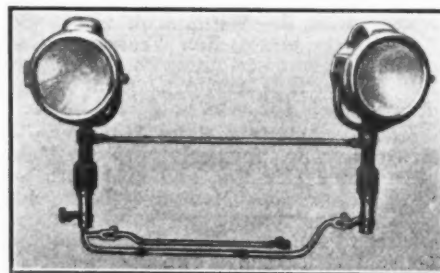


Fig. 3—Automatic lamps to illuminate turns

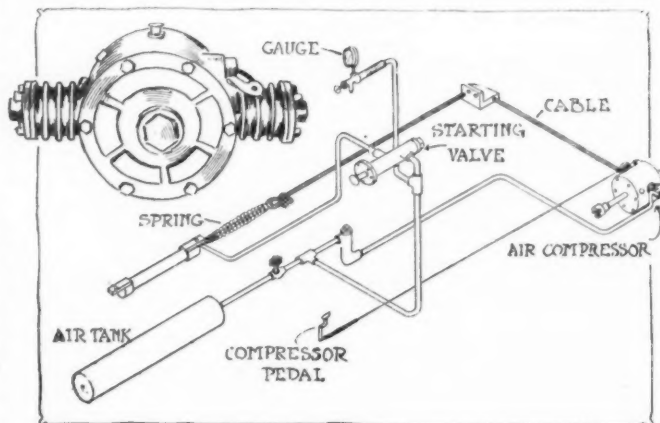


Fig. 4—Noll pneumatic starter. The air compressor that is attached to the front of the car is shown in the upper left and the piping diagram is shown below



Fig. 1—Firestone demountable rims for Fords

by a specially designed valve which is conveniently attached to the dash. The valve is fitted with patent seats which make leakage impossible. To start the engine, simply push the plunger with the foot and sufficient air is instantly carried to the starter to spin the motor at 600 revolutions per minute, much faster than any starter yet designed. The compressor is started and stopped from the seat, by means of a pedal similar to the ordinary muffler cut-out pedal.

The storage tank for compressed air, as well as the starting cylinder, is placed out of the way under the body of the car. Under the pressure gauge on the dash is fastened a specially constructed valve, with hose attachment, by the use of which any tire can be quickly and conveniently inflated, without the back-breaking work demanded by the old-fashioned foot pump. The compressor will inflate a 4 inch by 35 inch tire from complete deflation to 80 pounds in one and a half minutes. For ordinary pumping up of tires, sufficient air can be drawn from the storage tank without starting the compressor at all. It is made by the Carrier-Koeth Mfg. Co., Coudersport, Pa.

Burke Tire Valve—Ease of inflation is claimed for the tire valve shown in Fig. 5. At the left it is shown with the valve open and at the right it is closed, being held merely by the pressure in the tire. The valve is provided with a re-

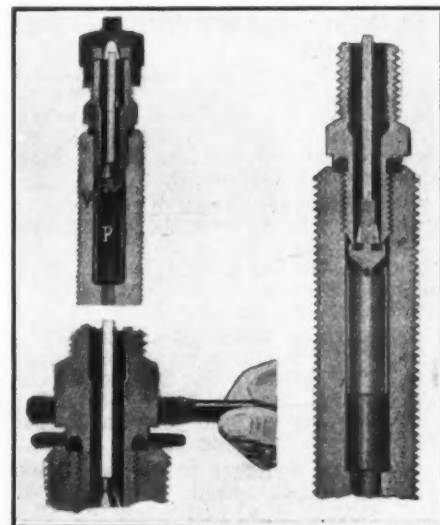


Fig. 5—Burke tire valve. The top left view shows the tire valve open. S is the removable stud, V is the valve proper, and P is a tube that limits the downward movement of the valve. The right view shows the valve closed. At the left, at the bottom is illustrated the method of cutting the gasket G

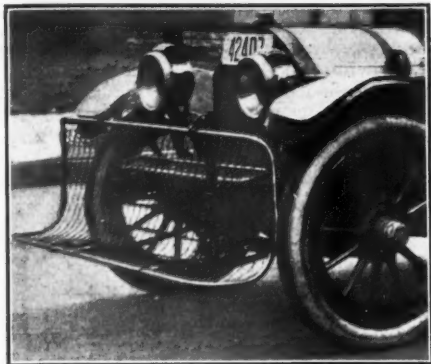


Fig. 6—Linquist automatic fender and brake

versible seat to give increased wear and the tire is deflated by depressing the plunger provided for the purpose. A feature of the device is that the stud is removable so that in case of injury it can easily be replaced.

The gasket between the two parts of the valve is automatically cut and may be made from leather, lead or any other packing material. This is shown at the left, the cutting being accomplished by screwing the two parts together with the gasket material between. The device is made by the Burke Tire Valve Co., 5213 Windsor avenue, Cleveland, O.

Stewart Radiator Meter—The Stewart Radiator Meter, described in THE AUTOMOBILE for August 20, differs from the model previously made in that the water in the radiator is at all times in contact with the thermostatic bar.

Linquist Automatic Fender—To insure the safety of those in the streets against being run over by automobiles and motor trucks, a fender, Fig. 6, has been brought out that automatically lowers itself when an object is struck and at the same time sets the brakes and shuts off the motor. It is made by Wm. A. Linquist, Minneapolis, Minn., and is attachable to any automobile. It takes up little room, extending only 15 inches in front of the car.

Airplex Inner Tires—Immunity against punctures and blowouts is guaranteed by the use of the Airplex inner tube, manufactured by the Airplex Inner Tire Co., St. Louis, Mo. It also protects the inner part of the tube. It consists of an outer cushion which takes the shocks, several layers of fabric to guard against blowouts and an inner tube that withstands the air pressure. The cushion is made of a vulcanized compound and contains no rubber, glue, glycerine, or similar materials. The inner tube is merely to hold the air.

Buob & Scheu Automobile Tops—Seat covers, dust covers and automobile tops for all the standard makes of automobiles are manufactured by Buob & Scheu, Court street and Broadway, Cincinnati, O. The seat and dust covers are waterproof and are made of the best material, it is stated. The arm rests are reinforced with leather. All the necessary hardware is furnished, together with instructions for applying.

Oakbrook Cyclecar Motor—A cyclecar motor, Fig. 7, with bore of 4 inches and stroke of 2.75 inches, and which develops 18 horsepower, it is stated, has been brought out by the Oakbrook Motor Mfg. Co., Reading, Pa. It is an L-head block construction with the valves on the left side and fully inclosed by two cover plates.

Exhaust and intake manifolds are cast

separately and the cylinder is a separate casting so that by removing it all the valves and the piston heads are rendered accessible.

This motor car can be furnished either as a separate unit or combined with clutch and gearset.

Ford Valve Grinder—A tool for refacing Ford valves, Fig. 8, is manufactured by the Liberty Tire & Supply Co., 102 Chambers street, New York City. It consists of a suitable guide and cutting tools. The cutting edge can easily be resharpened. The price is \$2.

Wireless Dash Light for Fords—H. J. Murphy & Co., Reading, Mass., is making a lamp, supplied with current by a self-contained battery, for attachment to the Ford steering post. In this position, it is stated that the dash is completely il-

luminated. When a trouble light is needed, it can be instantly detached and used wherever needed. The price is \$1.25 complete, and it is finished in black enamel, polished brass and nickel, as desired.

Standard Five-Cycle Engine—A special form of two-cylinder, two-cycle motor, Fig. 9, in which the exhaust gas from the cylinders is made to do work on a turbine type of flywheel, has recently been announced by the American Semi-Turbine Motor Co., 1414 Chouteau avenue, St. Louis, Mo.

It is stated that 30 horsepower at 1,200 revolutions per minute is developed, the bore and stroke being 4 and 5 inches respectively. The two cylinders are cast in a block. At either side of these cylinders there are flywheels, the peripheries of which are provided with vanes against which the exhaust gas is directed.

R. & H. Body—Fig. 10 shows a light car body brought out by the R. & H. Sheet Metal Co., Abington, Mass. The design of this body permits the comfortable and roomy seating of two passengers side by side. Allowance has also been made for the addition of an auxiliary seat in the main body, for a child or other small person. There is ample leg room, even with this extra seat. If wanted, the gasoline tank in the rear can be eliminated, and this space used for a rumble seat, in which case a special tank fitted underneath the cowl is used.

The large 6-inch springs in the seat cushion, and the 5-inch springs in the back cushion afford a measure of comfort seldom obtained in a low priced car. The upholstering material is good quality, black imitation leather.

The door, on the right side, allows for the installation of the popular left side drive. This allows easy access to the sidewalk on the right side of the street, against which most drivers prefer, and in many cases are compelled to stop.

The body is provided with two top irons placed on each side 22 inches apart allowing for easy attachment of the top. The hood is fitted with hinges at the top and finger hooks for lifting, permitting easy inspection of the motor.

Wolfe One-Man Top—Ordinary tops can be remodeled into one-man tops by means of a simple change in the front bows invented by J. Thurston Wolfe, 1843 Calvert street, Washington, D. C. The remodeling is effected by simply attaching the new side arms to the rear bow as shown in Fig. 11. The operation of the top is clearly indicated and therefore it will not be necessary to describe it. The retail price of a set of these bows is \$5, and it is stated that any one with a little mechanical skill can put them on. In addition to remodeling, it is intended to sell the sockets to manufacturers for

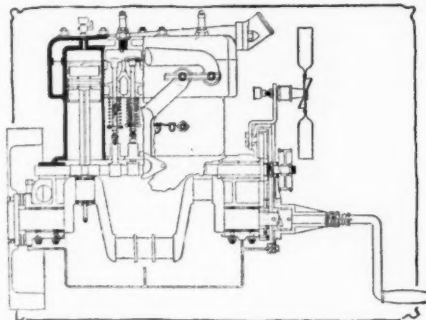


Fig. 7—Oakbrook cyclecar motor

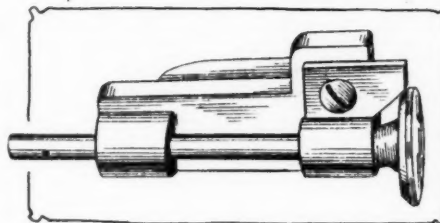


Fig. 8—Ford valve resurfacers or grinder

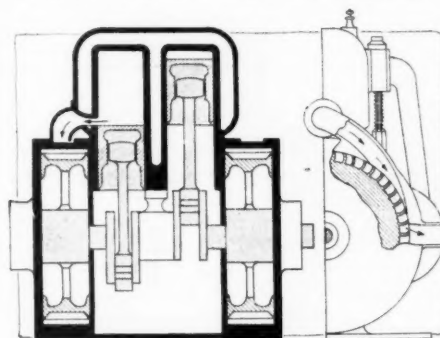


Fig. 9—Standard five-cycle motor

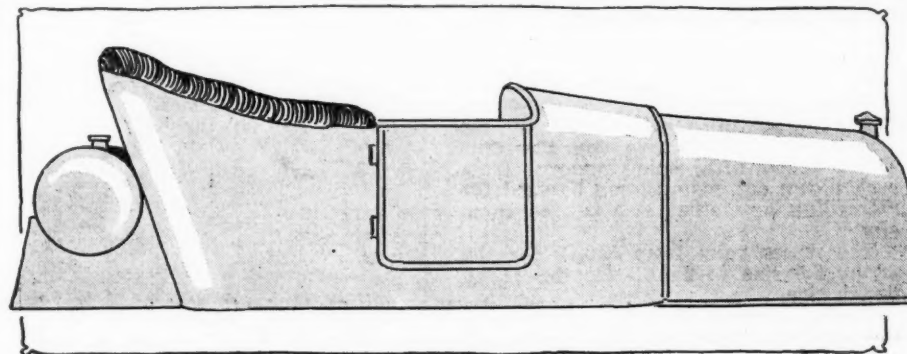


Fig. 10—R. & H. small car body. Also made with rumble seat and cowl tank

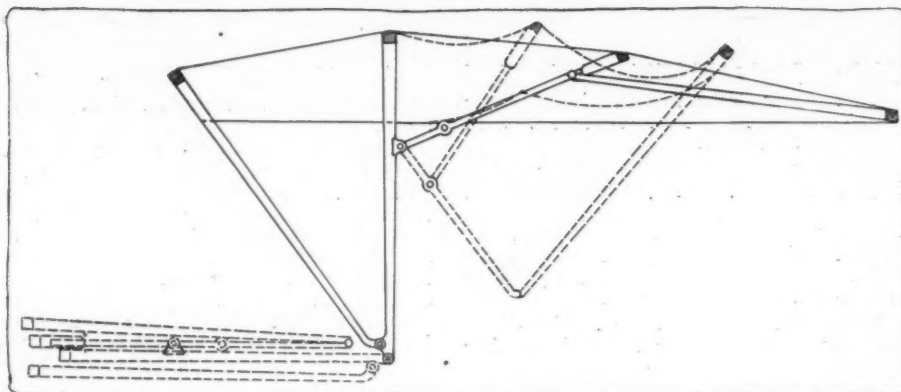


Fig. 11—Wolfe one-man top in three positions, up, half up, and down

new tops. This end of the work is taken care of by the American Distributing Co., Detroit, Mich.

Eight-Day Clock Free—An 8-day standard jewelers' regulator clock is offered to any dealer that will order one case of Non-Fluid oil, providing that he never handled this product before. A case consists of 12, 5-pound cans of K No. 000 Grade Non-Fluid oil at 14 cents per pound and the same amount of K No. 00 Special Grade, also at 14 cents. The former is for grease cups and the latter for gearsets. The clock is 38.5 inches high with a 12-inch dial and runs 8 days with one winding. It is incased in solid oak and will give good service for years, it is stated. The offer is made by the New York & New Jersey Lubricant Co., 165 Broadway, New York City.

Triple Tread Tires—At three-quarters the cost of a new plain tread tire, the Triple Tread Mfg. Co., 1545 Michigan avenue, Chicago, Ill., is offering to re-tread old casings with its steel studded leather tread, Fig. 12. Three plies of leather are used, the inner one inclosing the outside of the tire completely. A guarantee of at least 3,500 miles is given. Should the casing wear out before the tread, the latter can be transferred at a cost of from \$3 to \$6, depending on the size of the tire. This charge is to cover the cost of the labor.

The old casing is prepared to receive the tread by the removal of all the old and loose rubber, so that a firm foundation to which to fasten the tread is secured.

The three plies of chrome leather, one of which is brought down the sides of the tire and over the bead, form a tougher and more durable wearing surface than rubber giving better protection to the fabric against cuts, punctures, bruises, etc., it is stated.

The steel studs on the tread portion of the tire not only furnish absolutely the best protection against skidding making the use of chains unnecessary, but also protect the leather against being cut by glass, sharp rocks, etc., giving you the advantage of the highest priced imported steel studded tires.

Another feature is that should the old casing or foundation give way, the same Triple Tread, after being removed from such blown out casings, can be used for retreading any other tire of the same size.

The prices vary from \$10.75 for the 28 by 2.5 size to \$51.90 for the 41 by 6-inch size.

Perfect Process Vulcanizer—To meet the demand for a medium-priced vulcanizer, simple and safe in operation, the National Cement & Rubber Co., 300



Fig. 12—Triple tread leather tire

South St. Clair street, Toledo, O., has brought out a device, Fig. 13, in which heat is generated by the combustion of gasoline or alcohol. The vulcanizer is placed in an upright position and the fuel poured into the holes in the top. A piece of thin cloth dusted with soapstone is placed over the repair and the vulcanizer is clamped on, as shown. The fuel is then lighted, allowed to burn out and then left to stand for 5 minutes.

Lewis Ideal Tape Reel—Kolesch & Co., New York City, is making a tape reel that is featured by the geared handle which allows greater speed in winding.

It is made of hard aluminum alloy.

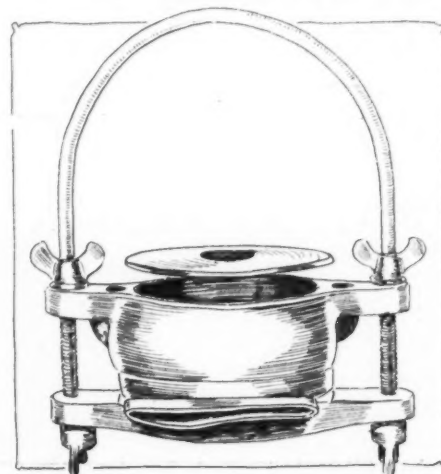


Fig. 13—Perfect Process vulcanizer

Wearing parts of hard steel, handle of bronze, 5 1-2 inches diameter, weight 10 ounces, with high-speed gearing, which will wind up 100 feet of steel tape in about 12 seconds.

Brake for stopping motion of tape at any point and holding it rigid without perceptible effort on the part of the operator. Valuable in winter, as it obviates the necessity of removing gloves.

Complete with 1-4-inch steel tape, 100 feet Eddy steel tape, \$17.50 and 100 feet Lufkin steel tape, \$15.

West Steel Wheels—Cast steel wheels for motor truck service are manufactured by the West Steel Casting Co., Cleveland, O. These wheels are made according to S. A. E. standards, and are produced in all sizes and styles. The advantages of these wheels are that they will not warp, twist, shrink or loosen—they are cast in one piece, and there are, consequently, no joints to open up, or bolts or rivets to break. Regardless of climate or weather, heat or cold, the shape and form remain the same.

Lefever Small Car Gearsets—Two types of gearsets, Fig. 14, are manufactured for light cars by the Lefever Arms Co., 600 Maltbie street, Syracuse, N. Y. One is a two-speed forward and reverse for cars of 10 to 15 horsepower, the weight of the car not exceeding 1,200 pounds, and the other is a three-speed selective type for cars of 15 to 20 horsepower, the weight of the car not exceeding 1,800 pounds. In both cases ball and roller bearings are used for the main shafts while the lay shafts are pinned to the casing and the gears are bushed.

Inner Tube Armor—A protection against punctures and blowouts in the form of an inner tube protector is made by the Inner Tube Armor Co., Detroit, Mich. This armor is a liner of cotton fabric and rubber into which metal disks are secured. The armor fits between the casing and the tube and it is claimed no internal cutting is possible.

Apco Starting Crank Holder—A simple starting crank holder for Ford cars is marketed by the Auto Parts Co., Providence, R. I. This holder consists of a piece of spring steel and is applied by removing the spring clip nuts. The slight bend in the spring keeps the crank handle in an upright position thus preventing rattling. It sells for 25 cents.

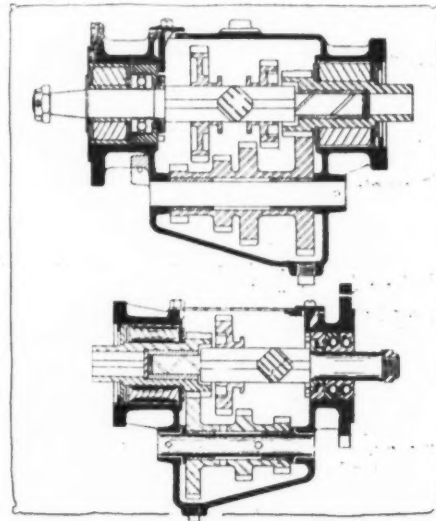


Fig. 14—Lefever small car gearsets. The upper one has three speeds and is for machines up to 20 horsepower, while the lower is a two-speed design for cars of 15 horsepower or under